ARTICLE

REHABILITATING INTERSTATE COMPETITION: RETHINKING THE "RACE-TO-THE-BOTTOM" RATIONALE FOR FEDERAL ENVIRONMENTAL REGULATION

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An influential justification for placing responsibility for environmental regulation at the federal level is that otherwise states would engage in a socially undesirable "race to the bottom," making their environmental standards too lax in an effort to attract and retain industry. After discussing the difficulties in empirically testing this theory, Professor Revesz shows that race-to-the-bottom arguments encounter no support in existing models of interjurisdictional competition. He then establishes that even if there were a race to the bottom over environmental standards, federal regulation would not be an effective response: faced with strict federal environmental standards, states concerned with attracting industry would relax regulatory controls in other areas. Professor Revesz concludes by showing that in the corporate-charter and bank-charter literatures, the race-to-the-bottom label has been used to identify issues distinct from those implicated in the term in the environmental context, and he offers a conceptual typology that elucidates the relevant distinctions.

INTRODUCTION

Perhaps the most widely accepted justification for environmental regulation at the federal level is that it prevents states from competing for industry by offering pollution control standards that are too lax. This competition is said to produce a "race to the bottom"—that is, a race from the desirable levels of environmental quality that states would pursue if they did not face competition for industry to the increasingly undesirable levels that they choose in the face of such competition.

Race-to-the-bottom arguments for federal environmental regulation became commonplace following two influential articles published by Professor Richard Stewart in 1977,¹ and were explicitly cited by Congress as

* Professor of Law, New York University. I would like to thank the participants at a law and economics workshop at Harvard Law School and at a faculty workshop at New York University School of Law, as well as Vicki Been, Samuel Estreicher, Thomas Griffith, Michael Herz, Louis Kaplow, Michael Klausner, Lewis Kornhauser, Peter Menell, Roberta Romano, Lawrence Sager, Michael Schill, Richard Stewart, and Peter Strauss for their comments on earlier drafts. Jeffrey Benz, Matthew Kaplan, and Steven Zwanger provided valuable research assistance. The generous financial support of the Filomen D'Agostino and Max E. Greenberg Research Fund at the New York University School of Law is gratefully acknowledged.

¹ Richard B. Stewart, Pyramids of Sacrifice? Problems of Federalism in Mandating State

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a central justification for the passage of important federal environmental statutes. More generally, the race to the bottom has been invoked as an overarching reason to vest regulation that imposes costs on mobile capital at the federal rather than the state level, and has been cited as one of the bases for the New Deal.

This Article challenges the accepted wisdom on the race to the bottom. It argues that, contrary to prevailing assumptions, competition among states for industry should not be expected to lead to a race that

Implementation of National Environmental Policy, 86 Yale L.J. 1196, 1212 (1977) [hereinafter Stewart, Pyramids of Sacrifice?] ("Given the mobility of industry and commerce, any individual state or community may rationally decline unilaterally to adopt high environmental standards that entail substantial costs for industry and obstacles to economic development for fear that the resulting environmental gains will be more than offset by movement of capital to other areas with lower standards."); Richard B. Stewart, The Development of Administrative and Quasi-Constitutional Law in Judicial Review of Environmental Decisionmaking: Lessons from the Clean Air Act, 62 Iowa L. Rev. 713, 747 (1977) [hereinafter Stewart, Environmental Decisionmaking] ("In the absence of a nondegradation requirement, 'clean' states might compete with one another for new development, leading to a 'commons' dilemma in which each state permits more degradation than it would prefer or allow if transaction costs did not preclude agreement with competing states.").


2 See text accompanying notes 40-57 infra.


The Supreme Court itself has invoked the race-to-the-bottom justification for federal regulation, particularly in New Deal cases under the commerce clause. In upholding federal minimum wage and maximum hour regulations, the Court stated:

The motive and purpose of the present regulation are plainly to make effective the Congressional conception of public policy that interstate commerce should not be made the instrument of competition in the distribution of goods produced under substandard labor conditions, which competition is injurious to the commerce and to the states and to which the commerce flows.

decreases social welfare; indeed, as in other areas, such competition can be expected to produce an efficient allocation of industrial activity among the states. It shows, moreover, that federal regulation aimed at dealing with the asserted race to the bottom, far from correcting evils of interstate competition, is likely to produce results that are undesirable.

This challenge to the validity of race-to-the-bottom arguments should lead to serious questioning of the federal environmental statutes. While there are other rationales for regulation at the federal level, they rest upon different empirical foundations and justify different forms of federal intervention than does the race-to-the-bottom rationale. Most importantly, the other prominent market-failure argument for federal environmental regulation is that, in the absence of such regulation, interstate externalities will lead states to underregulate because some of the benefits will accrue to other states. But interstate externalities explain only isolated parts of the federal environmental statutes, with a good portion of the remainder being justified on race-to-the-bottom grounds. Alternatively, one might justify federal regulation on public-choice grounds by arguing that state political processes systematically undervalue the benefits of environmental protection or overvalue the corresponding costs, whereas at the federal level the calculus is more accurate. But this rationale rests upon an empirical claim about failures in the political process rather than failures in the market for industrial location. Thus, at the very least, a different predicate would have to be constructed to defend the federal statutes.4

Part I defines the elements of the race-to-the-bottom rationale for environmental regulation, distinguishes it from competing arguments for federal intervention, and shows that important parts of the federal environmental statutes rely on this rationale. Part II sets the stage for the theoretical critique by addressing the significance of the recent decisions by a number of states to enact environmental standards more stringent than the corresponding federal standards. Although this development might seem to provide an empirical refutation of the applicability of race-to-the-bottom arguments in the environmental arena, in fact the presence of more stringent state standards does not provide such a refutation. Part III, through an analysis of the relevant theoretical literature, directly challenges the assumptions underlying race-to-the-bottom arguments for federal regulation. It suggests that existing models provide no support for such arguments, and thus that, at the very least, the burden should be on proponents of race-to-the-bottom claims to demonstrate the

4 Another argument for federal intervention might be the presence of economies of scale in regulation. For a comprehensive discussion of the various rationales for federal environmental regulation, see Stewart, Pyramids of Sacrifice?, supra note 1, at 1211-19.
analytical validity of their arguments. Part IV argues that, even if there were a race to the bottom over environmental regulation, federal intervention to stop that race would be inadvisable because it would have the undesirable effect of skewing other state regulatory or fiscal decisions. This Part concludes that race-to-the-bottom arguments in favor of federal environmental regulation represent a frontal attack on all state fiscal and regulatory powers. Part V moves beyond the environmental context and examines the use of race-to-the-bottom arguments in a number of other areas of the law. It claims that the race-to-the-bottom label has been used to describe problems that are best kept analytically distinct; attention to these distinctions, moreover, reveals the wider applicability of the analysis offered in this Article. This Part concludes that while the Article's arguments do not extend to the so-called race to the bottom over corporate charters or banking regulation, they do extend to state efforts to impose costs, through regulatory measures, on the physical assets of mobile capital in other regulatory areas.

I

THE RACE TO THE BOTTOM OVER ENVIRONMENTAL REGULATION

Because commentators have not paid sufficient attention to the characteristics a race to the bottom over environmental regulation would have, I start by defining the elements of the race. Second, I discuss the assumptions underlying race-to-the-bottom arguments for federal environmental regulation. Third, I distinguish such arguments from competing rationales for federal regulation. Finally, using the Clean Air Act as the primary example, I show the prominent role of race-to-the-bottom arguments in justifying federal intervention.

A. Definition of the Race

First, consider an "island" jurisdiction—a single jurisdiction surrounded by ocean, which is unaffected by what occurs beyond its borders. This island jurisdiction has a number of firms engaged in industrial activity that produces air pollution. The citizens of the jurisdiction suffer adverse health effects as a result of the pollution.

In the absence of regulation, the firms will choose the level of pollu-

5 A recent empirical study supports the central conclusion of this Article. See Stephen M. Meyer, Environmentalism and Economic Prosperity: Testing the Environmental Impact Hypothesis 23 (Massachusetts Institute of Technology, Project on Environmental Politics and Policy, Oct. 5, 1992) (on file with the New York University Law Review) (rejecting the claim that robust economic growth and development are more likely to be found among states with relatively lax environmental policies).
tion that maximizes their profits and, as is the case generally with externalities, will ignore the social costs produced by their activities—the costs borne by the citizens who must breathe air of poor quality. The firms will be able to produce their goods more cheaply and will pollute more than if they were forced to bear these social costs.

Traditional economic theory holds that the socially optimal level of pollution reduction is the level that maximizes the benefits that accrue from such reduction to the individuals who breathe the polluted air, minus the costs of pollution control. To achieve this optimal reduction, a regulator must force polluters to internalize the costs that they impose on breathers. For the purposes of this discussion, it does not matter whether the regulator achieves this goal through command-and-control regulation, Pigouvian taxes, marketable permit schemes, or other strategies. Finally, for comparative purposes, assume that in this island jurisdiction the level of pollution reduction chosen by the regulator does not affect entry into or exit from the market. Thus, the number of polluters in the jurisdiction will be independent of the actions of the regulator.

Second, consider instead a “competitive” jurisdiction. This jurisdiction is affected by the actions taken in other jurisdictions, and, in turn, its own actions have effects beyond its borders. I have in mind a state within a federal system.

In order to focus the discussion on the competition among states to attract industry, assume for now that there are no interjurisdictional pollution externalities. Assume further, for ease of exposition, that the total number of firms across jurisdictions remains fixed—that although firms can move from one jurisdiction to another, there is no entry into or exit from the national market. Within the national market then, other factors being equal, firms will try to reduce the costs of pollution control by moving to the jurisdiction that imposes the least stringent requirements.

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6 This discussion assumes that the transaction costs of bargaining between polluters and breathers are sufficiently high to preclude bargaining from yielding the socially optimal outcome. See generally Ronald H. Coase, The Problem of Social Cost, 3 J.L. & Econ. 1 (1960).

7 Command-and-control regulation, which is prevalent under the federal environmental statutes, simply directs firms to produce no more than a given number of units of particular pollutants (often the standards are expressed as units of pollution, e.g., pounds of sulfur dioxide emissions, per unit of product, e.g., million B.T.U. of electricity). Pigouvian taxes are taxes per unit of pollution set at a level equal to the marginal social damage of pollution. Firms are not restricted in the amount that they can pollute, but they must pay a tax for each unit of pollution that they generate. Pigouvian taxes thus force the polluter to internalize the externality. Finally, under marketable permit schemes, a governmental body defines a number of permits equal to the permissible number of units of pollution in the jurisdiction. The permits can then be traded freely in the market, and each firm is entitled to pollute a number of units equal to the number of permits that it holds. For discussions and comparisons of these strategies, see, e.g., William J. Baumol & Wallace E. Oates, The Theory of Environmental Policy 21-23, 155-234 (2d ed. 1988); Bruce A. Ackerman & Richard B. Stewart, Reforming Environmental Law, 37 Stan. L. Rev. 1333 (1985).
Industrial migration will occur whenever the reduction in the expected costs of complying with the environmental standards is lower than the transaction costs involved in moving.

As in the island situation, competitive jurisdictions will want to set a pollution reduction level that takes account of the benefits to its citizens of such reduction and of the costs to polluters in the jurisdiction of complying with this level. There will be, however, an additional factor to consider: the location of a firm can lead to the creation of jobs, and thus to increases in wages and taxes—important benefits for a state. As a result of this additional factor, competitive jurisdictions will consider the potential benefits, in terms of inflows of industrial activity, of setting standards that are less stringent than those of other jurisdictions, and, conversely, the potential costs, in terms of outflows of industrial activity, of setting more stringent standards.

Note, however, that if the costs of moving were infinitely high, a jurisdiction with contiguous neighbors would be functionally equivalent to an island jurisdiction. At this point, assume for simplicity that the impact of these costs will be faced exclusively within the jurisdiction. For example, the polluting firms may be sole proprietorships owned by a resident of the jurisdiction or corporations whose shareholders all reside in the jurisdiction. If there are out-of-state shareholders, the jurisdiction's calculus will be different, as it will not consider the costs to such shareholders, thus giving rise to an externality. This possibility is considered below, see text accompanying notes 76-77 infra, but does not have important consequences for the current discussion.

It is conceivable, however, that a firm could bargain with the state so effectively at the time that it considers where to locate that it could capture all of these benefits. The clearest example is a firm with exclusively out-of-state shareholders that induces a state to give up all the benefits that would otherwise accrue to it. But there is little theoretical or empirical support for this view. See note 10 infra (discussing empirical literature).

Along different lines, Richard Stewart points out that "[u]nder perfect market conditions, displacement of industry or economic development might not occur, because the costs of environmental controls would tend to be offset by lower wage rates reflecting more pleasant working and living conditions." Stewart, Pyramids of Sacrifice?, supra note 1, at 1212 n.6. He then notes, however, that in practice these adjustments will not take place because "labor and capital are imperfectly mobile, governmental and union policies inhibit wage rate adjustments, and individuals may be ignorant of some of the benefits of environmental quality, such as lessened health risks." Id.

More importantly, unless the full benefits of environmental controls are captured by the firm's workers, the firm will not be able to recover the costs of these controls through lower wages. In general, pollution disperses over a large area; many of the beneficiaries are therefore non-workers. Professor Stewart's argument is more pertinent for worker-safety standards, where the benefits of the regulatory scheme fall almost exclusively on individuals in a contractual relationship with the regulated party.

With this background in mind, I present the structure of the race-to-the-bottom argument. Remember, however, that I am not positing that a competitive jurisdiction will in fact engage in a race to the bottom. I am, instead, merely explaining the theoretical structure of race-to-the-bottom claims.

The simplest example of the race to the bottom is one in which there are two identical jurisdictions. Assume that State 1 initially sets its level of pollution reduction at the level that would be optimal if it were an island. State 2 then considers whether setting its standard at the same level is as desirable as setting it at a less stringent level. Depending on the benefits of pollution reduction, costs on polluters, and benefits from the migration of industry, the less stringent standard may be preferable, and industrial migration from State 1 to State 2 will ensue.

To recover some of its loss of jobs and tax revenues, State 1 then considers relaxing its standard, and so on. This process of adjustment and readjustment continues until an equilibrium is reached, in which neither state has an incentive to change its standard further.  

At the conclusion of this race, both states will end up with equally lax standards, and they will not experience any inflow or outflow of industry. Each of these competitive states will thus have the same level of industrial activity that it would have had as an island jurisdiction. So social welfare in these states, however, will be less than it would be in identical island jurisdictions, because, as a result of the race to the bottom, the states will have adopted suboptimally lax standards.

The race to the bottom is the result of non-cooperative action on the part of the states. If they could enter into an enforceable agreement to adopt the optimally stringent standard, they could maximize social welfare without the need for federal regulation.
An alternative to an agreement among the states is pressure by the states for federal regulation. Federal regulation is justified under the race-to-the-bottom theory because it can eliminate the undesirable effects of the race. If the federal regulation sets the standard at the level that the states would find optimal if they were islands, the states will be precluded from competing for industry by offering less stringent standards. They will end up with optimal, rather than suboptimally lax, standards, and they will not suffer the resulting loss in social welfare. In short, both states will be better off as a result of the federal regulation. The problem can thus be described in principal-agent terms, in which the principals, the states, empower an agent, the federal government, to achieve their goal of obtaining protective environmental standards.

The race to the bottom is a form of the prisoner's dilemma. In the typical example of the prisoner's dilemma, two individuals, who are factually guilty of a felony, are taken into custody separately and interrogated by a prosecutor who seeks to get them to confess. If neither confesses, the prosecutor can obtain only misdemeanor convictions that would result in sentences of one year for each individual. If only one confesses, the prosecutor is willing to offer that individual a plea bargain that would lead to a six-month sentence; the prosecutor can then obtain a felony conviction and a ten-year sentence for the other. If both confess, they will each get convicted of a felony but will receive a sentence of five years.

The prisoner's dilemma has several defining features. First, each in-
individual has a dominant strategy—a course of action that he follows regardless of what the other individual does. In this case, the dominant strategy for both prisoners is to confess: if the first suspect does not confess, by confessing, the second gets a six-month rather than a five-year sentence; if the first suspect confesses, by confessing as well the second suspect gets a five-year rather than a ten-year sentence. Second, if each individual uses his dominant strategy, the final outcome is Pareto-inferior in that both would have been better off with another outcome. Thus, in this case, use of their dominant strategies will lead both suspects to confess and obtain five-year sentences even though they could have received one-year sentences if they both had not confessed. Third, even if the individuals can communicate beforehand and agree to avoid the Pareto-inferior outcome, unless they can somehow enter into a binding agreement, they will ultimately defect and follow their dominant strategies.19

To see the applicability of the prisoner's dilemma, consider a simple race-to-the-bottom example in which each of two competitive jurisdictions has only two choices: it can either set the optimally stringent standard that it would choose if it were an island, or it can set a suboptimally lax standard. In the presence of a race to the bottom, if one jurisdiction sets the optimally stringent standard, the other will set the lax standard and will benefit from industrial migration; in contrast, if one jurisdiction sets a suboptimally lax standard, the other will do so as well to avoid the outflow of industry. Thus, where the jurisdictions must choose between only two environmental standards,20 the dominant strategy for each is to pick the suboptimally lax standard, even though they would both be better off picking the stringent standard.

The characterization of the problem as one of non-cooperation, which is central to the race-to-the-bottom theory, has important implications for the understanding of federalism. It sees federal regulation not as an intrusion on the autonomy of states, as it is often portrayed, but rather as a mechanism by which states can improve the welfare of their citizens. For example, under this view the presumption against federal regulation contained in Executive Order 12,612,21 which mandates federalism impact statements for federal regulation, would be misplaced: if one believes in the race to the bottom, one should not place procedural hurdles against regulation.22

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19 See P. Ordeshook, supra note 18, at 207.
20 Part IV discusses the situation in which each jurisdiction has more than two choices. See notes 118-121 and accompanying text infra.
22 Section 2 sets forth "Fundamental Federalism Principles." For example, section 2(e) provides: "In most areas of governmental concern, the States uniquely possess the constitutional authority, the resources, and the competence to discern the sentiments of the people and
Finally, it is important to stress that the existence of interstate competition for industry is not sufficient, by itself, to produce a race to the bottom or, consequently, to justify federal regulation. Obviously, a race to the bottom requires not just the existence of a “race,” but also that the race be “to the bottom.” This latter element requires, first, that a competitive jurisdiction adopt a less stringent pollution control standard than an otherwise identical island jurisdiction would have adopted. Second, it requires that the less stringent standards that emerge from the competitive process be socially undesirable. Otherwise, the case for federal regulation disappears, or, alternatively, federal regulation must be justified on a different basis.

Section 2 sets forth “Federalism Policymaking Criteria.” It stresses: “It is important to recognize the distinction between problems of national scope (which may justify Federal action) and problems that are merely common to the States (which will not justify Federal action) because individual States, acting individually or together, can effectively deal with them.”

The distinction between a race to less stringent standards and a race to lower levels of social welfare is not always well understood. For example, in the context of an argument against a national antisodomy law, William Van Alstyne states:

[A]n enormous amount of question-begging analysis has been expended upon demonstrating how Congress must be able to intervene, in order to head off the so-called “race to the bottom.” Given the mobility of capital and labor, so this claim holds, the “lowest” standards will tend to control unless Congress intervenes. But whose policy is “low” and whose is “high” depends wholly on one’s point of view . . .

William Van Alstyne, Federalism, Congress, the States and the Tenth Amendment: Adrift in the Cellophane Sea, 1987 Duke L.J. 769, 780 n.40. His characterization of the race to the bottom misconstrues what I take to be its distinctive characteristic: that as a result of the mobility of capital, jurisdictions face a prisoner’s dilemma that leads to an overall reduction in social welfare.

The mirror image of the race to the bottom is the not-in-my-backyard (NIMBY) syndrome. The NIMBY problem is that no jurisdiction wants to locate within its borders certain types of facilities that have undesirable environmental consequences, even though these jurisdictions would be collectively better off by having such facilities. For discussion of this phenomenon, see Kent E. Portney, Siting Hazardous Waste Treatment Facilities: The NIMBY Syndrome 23 (1991); Vicki Been, What’s Fairness Got to Do with It?: Environmental Equity and the Siting of Locally Undesirable Land Uses, 78 Cornell L. Rev. (forthcoming July 1993).

The solutions to these two problems are also diametrically opposed. The solution to race-to-the-bottom problems is federal minimum standards (federal floors), which would preempt less stringent but not more stringent state standards. In contrast, the solution to NIMBY problems is federal maximum standards (federal ceilings), which would preempt more stringent but not less stringent state standards.

Environmental advocates who believe in both the race to the bottom and NIMBY ought to have the burden of explaining why interstate competition can sometimes produce suboptimally lax standards, whereas at other times it can lead to suboptimally stringent standards. Further analysis of this important paradox is beyond the scope of this Article.
B. Underlying Assumptions

For expository convenience, the preceding discussion assumed that each jurisdiction was seeking to maximize social welfare (as traditionally understood by economists), that the competing jurisdictions had identical preferences for environmental quality, and that the number of firms across jurisdictions remained fixed. This Section demonstrates that none of these conditions is necessary for the existence of the race to the bottom or for the rationale for federal regulation that is based upon the existence of such a race.25

Consider an island jurisdiction that believes that the benefits to breathers of environmental protection should not be traded off, dollar for dollar, against the costs that polluters must bear. It might subscribe, for example, to some variant of the ecological perspective on environmental regulation, which is critical of the economic approach of equating costs and benefits without regard to the identity of the affected groups.26 The jurisdiction thus might believe that the benefits to breathers are more worthy of social protection than the costs imposed on polluters and might weight the former by a factor of, say, two.27 The standards set by such a jurisdiction, like the standards of a jurisdiction that seeks to maximize social welfare, will be forced downward in the presence of interjurisdictional competition for industry.28

Alternatively, an island jurisdiction might want to mandate the most stringent economically feasible standards, even if they cannot be justified on cost-benefit grounds—a regulatory objective that underlies

25 The discussion also assumes that individuals, unlike firms, are immobile. It is not uncommon to assume that, unlike capital, individuals do not migrate. Thus, they express their preferences through “voice” rather than “exit.” See Susan Rose-Ackerman, Does Federalism Matter? Political Choice in a Federal Republic, 89 J. Pol. Econ. 152, 155 (1981). See generally Albert O. Hirschman, Exit, Voice, and Loyalty: Responses to Decline in Firms, Organizations and States (1970). For further discussion of this assumption, see text accompanying notes 76, 84, 96, 101 infra.


27 Supporters of the ecological perspective might object to this objective function as well. I do not understand this perspective, however, to advocate the protection of environmental quality without any regard to cost. Thus, some type of balancing must be necessary. Obviously, there is nothing special about the factor of two, and the argument would proceed in the same way for any other factor.

28 Note that there is a distinction between a jurisdiction that considers the preferences of its residents and then weights the benefits of environmental protection by a factor of two, and a jurisdiction that does not give added weight to its residents' preferences, but where the residents value environmental protection very highly. The former is not acting consistently with traditional economic postulates, but the latter is.
important federal environmental and health and safety statutes.\textsuperscript{29} Such standards would be set at the point at which any increase in the stringency of the standards would lead to loss of industry through bankruptcy. In a competitive setting, however, such a jurisdiction would have to worry not only about the loss of industry through bankruptcy but also about its functional equivalent—the loss through migration—and it would set its standards accordingly. In both of these cases then, as well as for a wide variety of other plausible state objectives, the race-to-the-bottom argument would take the same form that it takes in welfare-maximizing jurisdictions. For simplicity, the bulk of the Article will refer to welfare-maximizing jurisdictions.

Similarly, if the race to the bottom exists when competitive jurisdictions have identical preferences for environmental quality, it also will exist when neighboring jurisdictions have different preferences. Consider, for example, a state that favors high levels of environmental protection. If this state is placed in a situation of interjurisdictional competition with a state that prefers less stringent standards, it will have to trade off its interest in environmental protection against its interest in retaining industry; all else being equal, this tradeoff will lead to the adoption of less stringent standards in the competitive situation than in the island situation.

Finally, the existence of a race to the bottom does not turn on the assumption of a fixed number of firms across jurisdictions. If there is potential entry of new firms, states will compete for them, just as they compete to attract firms from other jurisdictions. In fact, new firm entry exacerbates the competitive race. Whereas existing plants must determine whether the savings of complying with less stringent pollution control standards outweigh the transaction costs of moving, new plants do not face such costs. Their location decisions will be sensitive to smaller differences in the costs of compliance with environmental regulations.

\section*{C. Competing Rationales for Federal Regulation}

Race-to-the-bottom arguments are not the only rationales for federal regulation. The other plausible rationales do not depend on the existence of a race to the bottom, do not rest on the same empirical foun-

ations, and justify different forms of federal intervention. Given our system of federalism, in which state and local governments have broad police powers, and in which, throughout most of our history, they have had primary responsibility for health-and-safety regulation, there ought to be an affirmative justification for federal intervention. The justifications most commonly adduced in the environmental area fall into two categories: market-failure and public choice arguments.

The most prominent market-failure arguments are premised on the existence of either a race to the bottom or interstate externalities. The presence of interstate externalities is a powerful reason for intervention at the federal level: because some of the benefits of a state’s pollution control policies accrue to downwind states, states have an incentive to underregulate. But this incentive would exist even in the absence of a race to the bottom. Consider, for example, a world in which the transaction costs of relocating are so high that industry never contemplates moving and in which there is thus no possibility of a race to the bottom. Even in this static world, states would have the incentive to underregulate because part of the benefits of regulation would accrue to other states. Conversely, consider a world in which there are no interstate spillovers. Even if the adverse effects of pollution are felt only in the state that generates the pollution, this state still might choose to compete for industry by offering suboptimally lax standards.

The distinction between the race-to-the-bottom and interstate externality rationales is critical for determining the appropriate scope of federal regulation. The concern over interstate externalities can be ad-

31 See Stewart, Pyramids of Sacrifice?, supra note 1, at 1211-16.
32 Interstate competition, however, exacerbates the problem of interstate externalities. It adds the ability to attract industry to the benefits that a state obtains from suboptimally lax standards.
33 Frank Easterbrook writes:
   One of the common justifications for federal air pollution legislation is that, because no one state’s residents can collect all of the benefits of cleaner air (which, after all, drifts east, while dirty air comes in with the breeze), the states lack the proper incentives to legislate. If one state adopts optimally “tough” laws, businesses will migrate elsewhere. Frank H. Easterbrook, Antitrust and the Economics of Federalism, 26 J.L. & Econ. 23, 29 (1983). This statement appears to conflate externalities with the race to the bottom and not to recognize that the externality argument is independent of the possibility of interstate migration.
34 Economic theorists sometimes distinguish between technological (or real) externalities and pecuniary (or pseudo) externalities. See W. Baumol & W. Oates, supra note 7, at 29. A technological externality “is present whenever some individual’s (say A’s) utility or production relationships include real (that is, nonmonetary) variables, whose values are chosen by others (persons, corporations, governments) without particular attention to the effects on A’s welfare.” Id. at 17. Thus, for example, the pollution from an upwind state that decreases the utilities of individuals in the downwind state is a paradigmatic technological externality. Technological externalities lead to a misallocation of resources. Id. at 29-31. In the preceding
dressed by limiting the amount of pollution that can cross interstate borders, thereby "showing" upwind states the costs that they impose on downwind states. As long as the externality is eliminated, it would not matter that the upwind state chooses to have poor environmental quality—a central concern of race-to-the-bottom advocates. Conversely, one could imagine a situation in which the environmental quality in the upwind state is very high, but in which there is nonetheless a serious externality problem because the sources in the state have tall stacks and are located near the interstate border, so that their effects are felt only in the downwind state.35

The race-to-the-bottom rationale for federal regulation is also distinct from the public choice argument that the political processes at the state level undervalue environmental benefits. There is a general perception that groups seeking better levels of environmental quality are relatively more effective at the federal level, and, therefore, that federal regulation is likely to be more protective of the environment.36

This public choice observation has positive and normative components. As a positive claim, it simply explains that legislation protective of the environment is more likely to occur at the federal level. The normative public choice argument for federal regulation, however, needs to establish not only that environmental groups are relatively more effective at the federal level, but also that the state political processes in fact undervalue the benefits of environmental protection, or overvalue the corresponding costs, whereas the calculus at the federal level is more accurate.37

The public choice argument is independent of the race-to-the-bot-

example, firms employ production processes that produce more pollution than is socially optimal.

In contrast, in the case of a pecuniary externality, one individual's decisions affect the financial circumstances of another, but there is no misallocation of resources. Id. at 29. For example, "[a]n increase in the number of shoes demanded raises the price of leather and hence affects the welfare of the purchasers of handbags." Id. Such price effects "are merely the normal competitive mechanisms for the reallocation of resources in response to changes in demands and factor supplies." Id. at 30. This pecuniary externality does not lead to the production of handbags in a manner that departs from the social optimum.

Pecuniary externalities exist whenever a state relaxes a pollution control standard, since such an action affects the welfare of other states by luring away industry. But nothing is gained analytically by referring to the race to the bottom as a pecuniary externality. Thus, this Article uses the term "externality" to apply only to technological (or real) externalities.

36 See, e.g., Stewart, Pyramids of Sacrifice?, supra note 1, at 1213-15.
37 It could be that even though environmental interests are less influential at the state than the federal level, they produce an overvaluation of environmental benefits, or an undervaluation of environmental costs at both the federal and state levels. In this hypothetical, there is a public choice explanation for federal regulation (a positive claim) but no normative public choice argument for such regulation.
bottom claim. Even if industry were wholly immobile, environmental standards would still be more protective at the federal level if, as the public choice argument posits, environmental groups are more effective at this level. Conversely, the race-to-the-bottom argument is fully consistent with states properly valuing the benefits of environmental protection. Indeed, the examples in Section A assumed that states evaluate social welfare correctly.

Public choice and race-to-the-bottom arguments also rest on different empirical foundations. The former must be grounded on a showing of failures in the political process at the state level and of the better functioning of the political process at the federal level. The latter must be grounded on a showing of failures in the economic markets for industrial location.

Not surprisingly, these two rationales also call for different types of federal regulation. For example, while the race-to-the-bottom argument would not justify federal regulation of industry that is geographically immobile—for example, small dry cleaners that serve only a small adjoining area—the public choice argument would.

D. The Race to the Bottom and the Clean Air Act

I use the Clean Air Act, the oldest and most comprehensive of the modern federal statutes, to show that, among the market-failure rationales for regulation at the federal level, the race-to-the-bottom rationale explains far more of the statutory scheme than does the argument concerning interstate externalities, and that Congress explicitly justified important provisions of the statute by reference to the race to the bottom.

The Clean Air Act contains several provisions directed primarily at interstate externalities. Sections 110(a)(2)(D) and 126 seek to place limits on the amount of pollution from upwind states that is permitted to affect air quality in downwind states. Section 123 places constraints on a state's ability to use tall stacks as the method to meet ambient air quality standards, on the ground that the distance that pollution travels in-

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38 It may be, for example, that a state fails to take into account the effects of pollution on future generations. To make a normative public choice claim for federal regulation however, one needs to establish that future generations will be better protected at the federal level.

39 Obviously, such dry cleaners could move to another area. I treat them as geographically immobile, however, because if they move, they cannot continue to satisfy their customers. In contrast, a steel plant can sell products in the national market regardless of its location.

40 Because there is no evidence that the normative component of the public choice argument played an important role in shaping the statutory scheme, this Section contrasts only the two market-failure rationales.


creases with the height of the stack. The acid rain provisions of the 1990 amendments create a system of marketable permits to control the long-distance transport of contaminants that are precursors to acid rain.

By far the bulk of the provisions of the Clean Air Act, however, are wholly unrelated to the control of interstate externalities. The central provisions of the Act can be classified into two categories: ambient standards and emission standards. Ambient standards constrain the permissible concentrations of specified pollutants in the ambient air. Emission standards limit the quantity of pollutants that an individual emitter can place in the ambient air. Thus, ambient standards are not directed against any individual polluter; they simply constrain the aggregate emissions of all polluters that affect the ambient air at a particular location. In turn, emission standards are the vehicle for the achievement of the ambient standards; if every polluter meets its emission standards, the ambient standards ought to be achieved.

The Clean Air Act contains three types of federally mandated ambient standards. The national ambient air quality standards (NAAQS) seek to impose minimum levels of air quality throughout the country. Some areas, however, have ambient air quality levels that are better than the NAAQS. These areas are covered by a different, more stringent set of ambient standards determined by the "prevention of significant deterioration" (PSD) program. In turn, there are areas that have not yet met the ambient standards; the statute labels them "nonattainment areas." These areas are required to make "reasonable further progress" toward the achievement of the NAAQS.

The two major types of federally prescribed emission standards are the new source performance standards (NSPS), which apply to categories of stationary sources, and the standards for motor vehicles. In addition, new sources in PSD areas must meet "best available control technology" (BACT) standards, and new sources in nonattainment areas must meet emission standards determined by reference to the "lowest achievable emission rate" (LAER). Finally, existing sources in nonattainment areas must meet "reasonably available control" technology standards.

See id. § 7502(c)(2).
See id. § 7411.
See id. § 7503(a)(2).
See id. § 7502(c)(1).
The various ambient and emission standards do not address the problem of interstate externalities, since, as already indicated, a state could meet the standards and have a high level of air quality but nonetheless export a great deal of pollution to downwind states. Instead, the federal ambient standards can be justified, at least in part, on race-to-the-bottom grounds: one could argue that we need such standards because competition for industry would otherwise lead states to enact suboptimally lax state standards in an effort to attract more firms and to offer existing firms less stringent emission standards.\(^5\)

It is important to stress, however, that while this argument justifies federal intervention in general, it does not justify the particular ambient standards chosen by the federal statutes. If the states have different preferences for environmental protection, the standards that maximize social welfare will be different. Therefore, a uniform federal standard, such as the NAAQS would not be optimal.\(^5\) Depending on the nature of the differences, it is also conceivable that even if a race to the bottom exists, uniform federal standards actually might reduce social welfare.

Given the comprehensiveness of the ambient standards, the plausibility of a race-to-the-bottom justification for federally-mandated emission standards is less clear. Because the ambient standards constrain the total amount of pollution that a state can accept, a state that chooses to offer less stringent emission standards will simply be able to attract fewer sources. The determination of the contours of this tradeoff could be left to the states without triggering a race to the bottom. In situations in which the ambient standard is not binding, however, as is often the case under the PSD program, states could offer lax standards without facing any tradeoff; in these cases, federal emission standards can be seen as preventing a race to the bottom.

Further evidence that the race-to-the-bottom rationale underlies much of the Clean Air Act comes from the statute's legislative history. For example, at the time that it considered the 1977 amendments to the Clean Air Act, Congress perceived the prospect of the interstate migration of industry in search of more permissive environmental standards as a serious threat:

Without national guidelines for the prevention of significant deterioration a State deciding to protect its clean air resources will face a double threat. The prospect is very real that such a State would lose existing

\(^{53}\) This paragraph assumes that there are no federally prescribed emission standards. To the extent that such standards exist, a state's ability to offer lax emission standards will be constrained.

industrial plants to more permissive States. But additionally the State will likely become the target of "economic-environmental blackmail" from new industrial plants that will play one State off against another with threats to locate in whichever State adopts the most permissive pollution controls.55

Similarly, the legislative history of the NSPS standards state: "The promulgation of Federal emission standards for new sources . . . will preclude efforts on the part of States to compete with each other in trying to attract new plants and facilities without assuring adequate control of extra-hazardous or large-scale emissions therefrom."56

In summary, race-to-the-bottom arguments explain far more of the Clean Air Act than do interstate externality arguments. It is noteworthy, given the conclusions of this Article, that the provisions aimed at controlling interstate externalities have proven remarkably ineffective.57 Thus, a refutation of race-to-the-bottom arguments ought to lead to serious questioning of the overarching role that the Act assigns to the federal government.

II

THE IMPLICATIONS OF STATE REGULATION

The preceding Part set forth the conceptual structure of race-to-the-bottom arguments for federal regulation of the environment and suggested that such arguments have had an impact on the design of federal standards. Much of the rest of the Article will be devoted to a critique of the cogency and applicability of such arguments. This Part, however, addresses the significance of a recent empirical development: the adoption by many states of environmental standards more stringent than the corresponding federal standards. On its face, this development would seem to offer strong evidence that there is no race to the bottom in the environmental arena, thus providing empirical support for the general line of critique presented in this Article. This Part argues, however, that this recent development does not, in itself, rule out the possibility that there is a race to the bottom: one has to point to more than the current pattern of state regulation to undercut race-to-the-bottom claims.

A. The Proliferation of More Stringent State Regulation

The existence of state standards more stringent than the corresponding federal standards recently received a great deal of attention in connection with two actions of the Northeastern states. In April 1992, eight Northeastern states announced an agreement to reduce substantially the emission of nitrogen oxides by electric utilities. The control of such emissions is covered by the 1990 amendments to the Clean Air Act, but the Environmental Protection Agency (EPA) had not yet implemented the provisions, and had indicated that the controls, when imposed, would be weak. One utility estimated that its cost of compliance with the independent agreement would range from $10 million to $50 million; presumably this increased cost will be passed on to its industrial customers, who therefore will be placed at a competitive disadvantage vis-a-vis competitors in states not subject to the agreement.

A few months earlier, in October 1991, nine Northeastern states had announced that they would adopt California's pollution control requirements for automobiles, which are more stringent than the federal standards. The states that have indicated support for more stringent standards account for a large percentage of the market for new cars. Connecticut had initially been a member of this coalition but later withdrew; its Commissioner of Environmental Protection estimated that the state's economy would lose 1300 to 8000 jobs if the state adopted the more stringent California standards.

In a wide variety of other environmental areas, states have promulgated standards more stringent than the federal standards. In doing so,
they have raised the cost of in-state industrial activity.

B. An Example Involving Identical Jurisdictions

I proceed to show, by reference to a simple example involving two identical jurisdictions, that this proliferation of more stringent state standards is not necessarily inconsistent with the race to the bottom. Each of these identical jurisdictions has an equal number of sources that emit air pollution. These sources would each emit ten units of pollution if they were not subject to any pollution controls. Now assume that the jurisdictions institute controls, and let \( x \) and \( y \) be the required levels of pollution reduction for each source in States 1 and 2, respectively. The aggregate benefits of controlling pollution in each state are \( 10x \) and \( 10y \), respectively. Because the marginal costs of pollution control are likely to increase exponentially after a certain point, assume further that the corresponding aggregate costs are \( x^2 \) and \( y^2 \). Thus, if these two states were island jurisdictions, they would maximize social welfare by requiring each source to reduce its emissions by five units. Simple differentiation establishes that the expression \( 10x - x^2 \) is maximized at \( 10 - 2x = 0 \). Each jurisdiction would thereby obtain $25 of net benefits.

If, however, there is interjurisdictional competition and a race to the bottom, the equation would change to account for the net benefits (or costs) of migration into (or out of) each state. With a minor modification


The phenomenon of states enacting more stringent standards has not gone unnoticed by the popular press:

A new age of environmental federalism has dawned. In a stunning switch, the states are no longer merely implementing federal standards but are setting the environmental agenda. Passing more—and more stringent—controls on pollution than Congress ever considered, states and cities are protecting ground water, recycling garbage, mandating "clean" fuels and reducing acid rain. Every state now regulates the emission of toxic chemicals into the air; the city of Philadelphia alone has set standards for 99 toxics, while the U.S. Environmental Protection Agency has issued only seven. The states are forging ahead on their own because Congress and the White House can't or won't champion meaningful environmental reform—even on issues such as the greenhouse effect that have causes and consequences far beyond any state's borders.

E Pluribus, Plures: Without Leadership from Washington, the States Set the Environmental Agenda for the Nation, Newsweek, Nov. 13, 1989, at 70.
explained in the margin, assume that if State 1 has a standard more stringent than State 2, it suffers a loss, and State 2 receives a benefit, of $2(x-y)^2$. If State 1 has a standard less stringent than State 2, it receives a benefit, and State 2 suffers a loss, of $2(x-y)^2$.

The form of this function reflects the intuition that for small differences between the standards, there is little mobility because the lower cost of pollution control is outweighed by the transaction costs of moving. Thus, if the emission reduction standards in the two states differ by one unit, the state with the less stringent standard will gain only $2 in benefits, but if the standards differ by three units, it will gain $18 in benefits.

The payoffs to each of the states for the various combinations of emission reductions are set forth in Table I. In each box, the first number represents the payoff to State 1, and the second represents the payoff to State 2. For example, if State 1 requires three units of pollution reduction, and State 2 requires five units, State 1’s payoff is $29—the $21 that it would have obtained with a standard of three units in the absence of competition, plus the additional $8 in benefits that it receives from industrial migration for having a standard that is two units less stringent than State 2’s standard. State 2’s payoff is $17—the $25 that it would have obtained with a standard of five in the absence of competition, minus the $8 that it loses through industrial migration. Table I shows the payoffs for pollution reductions of only five units or less; if in the absence of interjurisdictional competition a state would not have adopted a standard more stringent than five units, it follows a fortiori that it will not do so in a competitive regime.

\[\begin{array}{|c|cccccc|}
\hline
\text{Emission Reductions} & 0 & 1 & 2 & 3 & 4 & 5 \\
\hline
0 & 0,0 & 2,7 & 8,8 & 18,3 & 32,\text{--8} & 50,\text{--25} \\
1 & 7,2 & 9,9 & 11,14 & 17,13 & 27,6 & 41,\text{--7} \\
2 & 8,8 & 14,11 & 16,16 & 18,15 & 24,12 & 34,7 \\
3 & 3,18 & 13,17 & 15,18 & 21,21 & 23,22 & 29,17 \\
4 & \text{--8,32} & 6,27 & 12,24 & 22,23 & 24,24 & 26,23 \\
5 & \text{--25,50} & \text{--7,41} & 7,34 & 17,29 & 23,26 & 25,25 \\
\hline
\end{array}\]

66 See notes 67, 69 infra.

67 The departures from the formula occur for the (2,3) and (2,4) pairs, where State 2’s payoff is 15 and 12, respectively, rather than 19 and 16, and for the (3,2) and (4,2) pairs, where State 1’s payoff is 15 and 12, respectively, rather than 19 and 16. The reason for this modification is set forth in note 69 infra.
If State 1 initially chooses a standard of five units of pollution reduction, State 2 will pick a standard of zero, through which it attains the highest payoff: $50. State 1 now finds itself with a payoff of $-25. Given that State 2 has now adopted a standard of zero, State 1 maximizes its payoff by picking a standard of two. State 2 then responds with a standard of two. The choice by each state of two units of pollution reduction is an equilibrium solution because, when both states regulate at this level, neither has an incentive to move to another level. An examination of Table I also reveals that there is no other equilibrium solution.

The result is that each state receives net benefits of $16, rather than the $25 that they each would have received as island jurisdictions, or if they had been able to enter into a binding agreement to enact standards of five. Thus, as a result of non-cooperative action, both states are made worse off—the race is, therefore, a race to the bottom.

Consider, now, the effect of a federal regulatory scheme that sets a minimum level of pollution control but allows states to impose more stringent state standards. This approach is followed by most federal environmental statutes, which have explicit provisions indicating that more stringent state standards are not preempted. A federal regulatory standard requiring two or fewer units of pollution reduction would have no impact on the states’ level of pollution control. Both would continue to require two units of pollution reduction.

The situation is different if the federal standard is set at three units of pollution reduction. If State 1 initially decides not to enact a more

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68 Part I gave the example of states that could choose among two possible standards and showed that the structure of their relationship was akin to a prisoner's dilemma, in that the dominant strategy for each was to choose the suboptimally lax standard. See text accompanying notes 17-20 supra. Where the states face more than two choices, there is no longer a dominant strategy equilibrium: the choice for each state depends on the other state's choice. This weaker notion of an equilibrium is known as a Nash equilibrium. See P. Ordeshook, supra note 18, at 118. Thus, technically, Table I does not represent a prisoner's dilemma, although it does represent a more general form of a non-cooperative game. It captures, however, the defining element of the race to the bottom: that, as a result of their inability to coordinate their actions, states suffer a loss in social welfare.

69 The reason for the modifications discussed in note 67 supra is to avoid an equilibrium in mixed strategies. With the payoffs dictated by the formula discussed in the text, if State 1 initially chooses a standard of 5, State 2 responds with 0, State 1 with 2, State 2 with 3, State 1 with 4, State 2 with 0, and so on. But despite the lack of an equilibrium in pure strategies, there is a race to the bottom, since under this combination of strategies the states are worse off than they would have been as island jurisdictions choosing a standard of 5.

In pure strategy equilibria, the actors' choices are determined with certainty; in mixed strategy equilibria, the actors assign a probability to a set of outcomes, so that the probabilities sum to one. See R. Luce & H. Raiffa, supra note 18, at 68-70; P. Ordeshook, supra note 18, at 133-34.

stringent standard, State 2 would improve its situation by setting a pollution reduction standard of four: its net benefits of $22 are higher than for any of the other possible standards. Absent the federal standard, State 1 would then maximize its net benefits by setting a standard of zero, and both states would eventually reach an equilibrium in which they mandate pollution reductions of two units.

But State 1 is precluded by the federal regulation from adopting a standard less stringent than three. Given this constraint, and given State 2's choice of a standard of four, State 1 maximizes its net benefits by choosing a standard of four as well. State 2's optimal response to the choice by State 1 of a standard of four is to retain its standard of four. There is an equilibrium solution in which both states require reductions of four. Table I reveals that this equilibrium is unique.\(^7\)

Thus, there are situations in which states that would have raced to the bottom in the absence of federal regulation, when subject to such regulation, set state standards that are more stringent than the federal standards. This example involves states that have equal preferences for environmental protection. The adoption by one jurisdiction of standards more stringent than the federal standards therefore does not stem from its higher valuation of environmental quality.

The effect of federal regulation is to constrain the gain in welfare resulting from industrial migration that a state can obtain by setting a less stringent standard. In some situations, without the constraint imposed by federal regulation, this gain would be greater than the loss in welfare produced by a lax standard. With the constraint, however, the opposite is sometimes true: the state sometimes gains more in welfare by having a stricter standard than it loses through industrial migration.\(^2\)

The argument is a limited one. It does not imply, even in the simple case of two identical jurisdictions, that whenever a federal standard is set, states will move to set more stringent state standards. First, if the federal standard is at the level that would be optimal for the states if they were island jurisdictions, or at a more stringent level, then the states will not respond with a more stringent standard. Second, if the federal standard is set at the level that the states would choose absent regulation, or at a less stringent level, it will not have any impact on the environmental quality in the states.

Third, there will be some instances in which states will not move to enact more stringent standards as a result of federal regulation, even if

\(^7\) If the federal standard were 4 or 5, the state would not adopt more stringent state standards.

\(^2\) There is, on this account, the possibility of a corrective mechanism for federal standards that are too lax: states can enact more stringent standards. No similar corrective mechanism exists for federal standards that are too stringent.
the federal standard is between the optimal level for the states as islands and the equilibrium that they would reach under competition in the absence of federal regulation. In the example represented in Table I, for instance, although the states will react to a federal standard set at three units by setting their own standards at four, they will not respond to a federal standard set at four units by setting their own at five: in the latter situation they will remain at four units. It is only for particular tradeoffs between the various goals, as illustrated by the effects of different federal standards in Table I, that more stringent state standards will result.

The case of jurisdictions with different preferences concerning environmental quality is conceptually similar. In the absence of federal regulation, the jurisdictions will reach an equilibrium in which the jurisdiction with the higher preference generally will enact a more stringent standard. If the federal regulation is more stringent for each state than their optimal levels as island jurisdictions, the states will not react by enacting more stringent standards. In contrast, the federal regulation will have no effect if it is less stringent, for both states, than the equilibrium that they would reach in the absence of such regulation. But when the federal regulation is, for at least one of the states, between the island level and the competitive level, it might induce state standards more stringent than the federal standards.

III
THE UNCERTAIN THEORETICAL FOUNDATION OF RACE-TO-THE-BOTTOM ARGUMENTS

The preceding discussion establishes the need for a theoretical inquiry into the plausibility of race-to-the-bottom claims. Until now, the legal literature has done little more than assert in a conclusory fashion that interstate competition to attract industry will reduce a jurisdiction's social welfare. It has not shown why, when an island jurisdiction is placed in a competitive situation, it becomes a participant in a race to the bottom. This Part demonstrates that there is no support in the theoretical literature on interjurisdictional competition for the claim that, without federal intervention, there will be a race to the bottom over environmental standards.

A. An Initial Hurdle

Race-to-the-bottom advocates must clear an initial hurdle: for the competition among states to attract industry to be a race to the bottom, interstate competition must be socially undesirable. But interstate competition can be seen as competition among producers of a good—the right to locate within the jurisdiction. These producers compete to at-
tract potential consumers of that good—firms interested in locating in the jurisdiction. Even though states might not have the legal authority to prevent firms from locating within their borders, such firms must comply with the fiscal and regulatory regime of the state; the resulting costs to the firms can be analogized to the sale price of a traditional good.

If one believes that competition among sellers of widgets is socially desirable, why is competition among sellers of location rights socially undesirable? If federal regulation mandating a supra-competitive price for widgets is socially undesirable, why is federal regulation mandating a supra-competitive price for location rights socially desirable?73

It is easy to identify possible distinctions between a state as seller of location rights and a firm as seller of widgets. These differences, however, provide scant support for race-to-the-bottom claims.74 In what follows, I briefly discuss each of the key differences between the state, as seller of location rights, and the market competitor, showing that none of the differences suggests that interstate competition in the environmental area will decrease welfare.

First, if individuals are mobile across jurisdictions, the costs that polluters impose on a state's residents will depend on who ends up being a resident of the state; the resulting supply curve is thus far more complex than that of a widget seller.75 The mobility of individuals, however, is not an element of race-to-the-bottom claims and should not be relevant to the plausibility of the claim that competition among states will decrease welfare.76

Second, to the extent that the shareholders of a polluting firm reside in the jurisdiction, the state as seller of location rights would at least attempt to take their welfare interests into account in computing the price to charge. In contrast, the seller of widgets would be indifferent to the effect of the sale price on the welfare of the good's purchaser. If a

73 Steven Kelman attempts to provide an answer. He notes that traditional social welfare functions take into account both the benefits that individuals get from pollution control and the costs that pollution control measures impose on industry. See Kelman, supra note 12, at 42. Then he asks: "What if the desire of states for strict environmental regulation or welfare measures . . . should not simply be thrown in together with the desire of businesses to avoid regulation or taxes?" Id. He argues that the preferences of industry should be taken into account only if they are ethically justifiable. He admits that "to state questions of this nature is not to answer them." Id. at 43. Thus, in the end, Kelman does not provide an argument for supra-competitive profits on the part of states. For a forceful rejoinder, see Walter Olson, Competition Among States: A Response, Regulation, May-June 1982, at 44.

74 In isolated instances, the legal literature has alluded to the analogy between a firm as seller of a good and a jurisdiction as seller of a location right, but it has not considered the obvious difficulties raised by the analogy. See Easterbrook, supra note 33, at 28.

75 Because race-to-the-bottom advocates do not face this complexity, they must assume implicitly that individuals are not mobile.

76 This Article proceeds on the assumption that individuals are immobile. See note 25 supra.
firm's shareholders do not reside in the regulating jurisdiction, and if firms are immobile, a state could extract monopoly profits by setting suboptimally stringent standards; if firms are mobile, competition would eliminate this problem.\textsuperscript{77} The converse—that if shareholders reside in the jurisdiction, the environmental standards will be suboptimally lax—does not follow.

Third, states are not subject to the discipline of the market. If a producer of widgets sells at a price that does not cover its average costs, it will have to declare bankruptcy. A state, in contrast, will continue in existence even if it recklessly compromises the health of its residents. The difference merely establishes that a state might undervalue environmental benefits.\textsuperscript{78} But such undervaluation is possible even for an island jurisdiction and is not a consequence of the competition among states to attract firms.\textsuperscript{79}

Fourth, states do not sell "location rights" at a single-component price; they require that firms comply with a variety of regulatory standards and pay taxes. The resulting market is thus more complex than one involving the sale of a traditional good. For example, a jurisdiction that imposes a lax worker-safety standard but a stringent pollution standard will be desirable for a labor-intensive, non-polluting firm, whereas a jurisdiction with stringent worker-safety and lax pollution standards will be desirable for a capital intensive, polluting firm. It is far from clear, however, why this additional complexity in the market would make interstate competition destructive.\textsuperscript{80}

In sum, while the analogy between interstate competition for industrial activity and markets for traditional goods is not perfect, it raises serious questions about race-to-the-bottom claims. At the very least, it should place on race-to-the-bottom advocates the burden of identifying the relevant differences between the two markets and explaining why they turn otherwise desirable competition into a race to the bottom.\textsuperscript{81}

\textsuperscript{77} See note 8 supra.

\textsuperscript{78} It is conceivable that a state would charge too much for the right to locate. A producer of widgets that sets its price too high will just as surely go out of business as one that sets its price too low. If states systematically charged too much, however, there would be no race-to-the-bottom problem.

\textsuperscript{79} In a public choice model, such undervaluation is likely to occur if environmental groups are ineffective at the state level. See text accompanying notes 36-39 supra.

\textsuperscript{80} I do not consider the difference in the markets that arises from the presence of interstate externalities, because I treat this problem as distinct. See text accompanying notes 31-35 supra.

\textsuperscript{81} It is paradoxical that, in the environmental area, the generally accepted premise is that jurisdictions extract too low a price from firms. In the land-use context, as illustrated by Nollan v. California Coastal Comm'n, 483 U.S. 825 (1987), influential support exists for the proposition that the price that jurisdictions extract is too high. For a comprehensive discussion of this problem, see generally Been, supra note 1.
B. The Theoretical Literature

Rather than undertake the daunting task of describing the numerous economic models that shed some light on the race-to-the-bottom question, I center my account of the development and current state of the literature on a discussion of three principal works. Some extensions are discussed in the margin.

In his influential article published in 1956, Charles Tiebout argues that a decentralized governmental structure, with multiple jurisdictions competing for residents, produces a Pareto-optimal outcome.\(^2\) Tiebout makes seven important assumptions.\(^3\) First, individuals are fully mobile and choose the jurisdiction in which they wish to live based on the taxes that the jurisdiction imposes on its residents and the bundle of services, such as parks, police protection, roads, and schools, that it provides. Second, individuals have full knowledge of the tax and services packages offered by the communities. Third, there exist a large number of communities in which individuals can choose to live. Fourth, in making their decisions, individuals do not consider the employment opportunities offered by the communities; everyone is assumed to live on dividend income. Fifth, the public services provided by the communities do not impose positive or negative externalities on other communities. Sixth, every community has an optimal size, defined as the number of residents for which the bundle of services can be produced at the lowest average cost. Seventh, communities below the optimal size seek to attract new residents in order to lower the average cost of providing services.

Tiebout argues that individuals will sort themselves into the jurisdictions offering the mix of taxes and public services that they prefer and that these jurisdictions will be of the optimal size.\(^4\) He concludes that it is therefore preferable to provide public services at the local level, rather than at the federal level and, more pertinently, that inter-jurisdictional competition is desirable.\(^5\)

Two of Tiebout's assumptions are problematic for my purposes. His fourth assumption—that individuals do not consider the employment opportunities of their prospective communities and that no productive activities take place in those communities—assumes away the issue that is central to the race-to-the-bottom argument: the effects on the environment of efforts by jurisdictions to attract firms in order to provide jobs

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\(^3\) Id. at 419.
\(^4\) Id. at 420.
for their residents. Second, much of the legal literature has dismissed as unrealistic the assumption of perfect mobility by individuals.\textsuperscript{86} There may, indeed, be substantial transaction costs in exiting one jurisdiction and moving to another, particularly in a world in which individuals have jobs and do not live solely on dividend income.

In his article published in 1975, William Fischel extends the Tiebout analysis to deal with the problem of industrial location.\textsuperscript{87} In his model, firms are owned by outsiders to the jurisdiction, do not employ any of the jurisdiction's residents, and all of their production is for export from the jurisdiction.\textsuperscript{88} The environmental externalities produced by these firms are uniformly distributed over all the residents, and there are no interjurisdictional spillovers.\textsuperscript{89} Each firm has the same impact on environmental quality, and this impact is additive across firms, so that two firms have twice the impact of one firm.\textsuperscript{90}

Fischel contemplates that jurisdictions are able to exclude firms through zoning decisions.\textsuperscript{91} They will refuse to permit a firm to locate unless it makes a direct cash payment to the zoning board, to be divided equally among the residents. The minimum amount that a jurisdiction would demand for the deterioration of its environmental quality is equal to the environmental harm caused by the firm. Any amount over this minimum constitutes a "profit," which competition among jurisdictions will drive to zero.\textsuperscript{92}

Jurisdictions that value environmental quality highly will allow fewer firms to locate and therefore obtain a smaller payment. If an individual values environmental quality less highly than his neighbors, he will move to a jurisdiction in which more firms are accepted, and the corresponding payments are higher. The result is that, in each jurisdic-

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\item\textsuperscript{86} See, e.g., James M. Buchanan & Charles J. Goetz, Efficiency Limits of Fiscal Mobility: An Assessment of the Tiebout Model, 1 J. Pub. Econ. 25 (1972); Carol M. Rose, Planning and Dealing: Piecemeal Land Controls as a Problem of Local Legitimacy, 71 Cal. L. Rev. 837, 909 (1983).
\item\textsuperscript{87} See William A. Fischel, Fiscal and Environmental Considerations in the Location of Firms in Suburban Communities, in Fiscal Zoning and Land Use Controls 119 (Edwin S. Mills & Wallace E. Oates eds., 1975).
\item\textsuperscript{88} See id. at 126.
\item\textsuperscript{89} See id.
\item\textsuperscript{90} See id. A more realistic model would view pollution as an input to the production process; a firm's level of emissions would then be a function of the amount that it has to pay in order to pollute. If a firm has to pay the social cost of its pollution, it will pollute the socially optimal amount. The prospect of making such payments will induce it to reduce its pollution until the cost of a unit of further reduction is higher than the harm caused by that unit. While Fischel eventually relaxes the assumption of equal environmental impacts, he continues to assume that each firm has a fixed impact on environmental quality, which is not affected by the size of the payment that it must make to the community in which it locates. See id. at 136-41.
\item\textsuperscript{91} See id. at 126.
\item\textsuperscript{92} See id. at 127-28.
\end{itemize}
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tion, individuals will have the same preference for environmental quality. Fischel argues that, under these restrictive assumptions, the problem of environmental externalities is solved in a Pareto-efficient manner: firms compensate residents fully for the environmental harms that they cause.

The Fischel model suggests that competition among jurisdictions leads to economically desirable results, rather than to a race to the bottom. Two of his assumptions, however, are troubling. First, under his model, firms do not hire residents of the jurisdiction in which they locate. Thus, like Tiebout, he assumes away one of the cornerstones of race-to-the-bottom arguments: that jurisdictions will relax their environmental standards to suboptimal levels in order to provide jobs for their residents. Second, also like Tiebout, Fischel assumes that individuals are perfectly mobile.

These two shortcomings are addressed by Wallace Oates and Robert Schwab in an article published in 1988. In their model, jurisdictions compete for a mobile stock of capital by lowering taxes and relaxing environmental standards that would otherwise deflect capital elsewhere. In return for an increased capital stock, residents receive higher incomes in the form of higher wages. The community must, however, weigh the benefits of higher wages against the cost of foregone tax revenues and lower environmental quality.

Oates and Schwab envision jurisdictions that are large enough to allow individuals to live and work in the same jurisdiction. Moreover, they assume that there are no interjurisdictional externalities: pollution generated in one jurisdiction does not spill over into another.

Each jurisdiction produces the same single good, which is sold in a national market. The production of the good requires capital and labor and produces waste emissions. The instrument of environmental policy is command-and-control regulation: each jurisdiction sets the total amount of allowable emissions. In addition, each jurisdiction raises revenues by levying a tax on each unit of capital. Capital is perfectly mobile across jurisdictions and seeks to maximize its after-tax earnings.

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93 See id. at 128-29.
94 See id. at 129. After establishing this result, Fischel relaxes some of the preceding assumptions. See id. at 129-49.
95 See text accompanying note 88 supra.
96 See Fischel, supra note 87, at 128-129.
98 Id. at 336.
99 The assumptions of the model are set forth in id. at 336-38.
100 Oates and Schwab point out that the results would be no different if, instead, the jurisdictions set Pigouvian taxes. See id. at 336 n.2.
Unlike capital, however, labor is perfectly immobile.\textsuperscript{101} Each individual in the community, who is identical in both tastes and productive capacity, puts in a fixed period of work each week, and everyone is employed. Additional capital raises the productivity of workers and, therefore, their wages.

Oates and Schwab describe the role of an individual resident of a jurisdiction as follows:

First, he is a consumer, seeking in the usual way to maximize utility over a bundle of goods and services that includes a local public good, environmental quality. And, second, he supplies labor for productive purposes in return for his income. From the latter perspective, residents have a clear incentive to encourage the entry of more capital as a means to increase their wages. But this jurisdiction must compete against other jurisdictions. To attract capital, the community must reduce taxes on capital (which lowers income and, therefore, indirectly lowers utility) and/or relax environmental standards (which lowers utility directly). These are the tradeoffs inherent in interjurisdictional competition.\textsuperscript{102}

Each jurisdiction makes two policy decisions: it sets a tax rate on capital and an environmental standard. Oates and Schwab show that competitive jurisdictions will set a tax rate on capital of zero.\textsuperscript{103} For positive tax rates, the revenues are less than the loss in wages that results from the move of capital to other jurisdictions; subsidies would cost the jurisdiction more than the increase in wages that additional capital would generate.

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.\textsuperscript{104} Pollution beyond this level generates an increment to wage income that is less

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\textsuperscript{101} Id. at 337. In a companion, unpublished manuscript, Oates and Schwab argue that their conclusion that competition among states produces efficient outcomes holds even if individuals are mobile. See Wallace E. Oates & Robert M. Schwab, Pricing Instruments for Environmental Protection: The Problems of Cross-Media Pollution, Interjurisdictional Competition and Interregional Effects (Nov. 1987) (unpublished manuscript, on file with the New York University Law Review) (cited in Oates & Schwab, supra note 97, at 337 n.7).

If individuals are mobile, they will sort out, as in the Tiebout model, by reference to their preferences for environmental protection. Individuals who are willing to trade off a great deal in wages for better environmental quality will move to jurisdictions that impose stringent controls on industry; individuals who attach less importance to environmental quality will go to dirtier areas. Thus, environmental protection does not raise the same problem as income redistribution. As explained below, redistribution is unlikely to be effective at the state level. See note 114 infra.

\textsuperscript{102} Oates & Schwab, supra note 97, at 338 (citations omitted).

\textsuperscript{103} Id. at 339. A jurisdiction should therefore raise its revenues in some other way—for example, through head taxes.

\textsuperscript{104} Id. at 340-41.
than the value of the damage to residents from the increased pollution; in
contrast, less pollution creates a loss in wage income greater than the
Corresponding decrease in pollution damages.105

Oates and Schwab show that these choices of tax rates and environ-
mental standards are socially optimal.106 First, consider tax rates. One
condition for optimality is that the marginal product of capital—the in-
crease in the output of the good produced by an additional unit of capi-
tal—must be the same across jurisdictions. Otherwise, it would be
possible to increase aggregate output, and, consequently, aggregate social
welfare, by moving capital from a jurisdiction where the marginal prod-
uct of capital is low to one where it is high. Because capital is fully
mobile, the market will establish a single rate of return on capital. This
rate is equal to the marginal product of capital minus the tax on capital.
The choice by a competitive jurisdiction of a tax of zero equates the
marginal product of capital across jurisdictions and is therefore consis-
tent with optimality.107

With respect to the environmental standard, competitive jurisdic-
tions equate the marginal private cost of improving environmental qual-
ity (measured in terms of forgone consumption) with the marginal
private benefit. For tax rates of zero, the marginal private cost is, as
noted above, the decrease in wage income produced by the marginal unit
of environmental protection. This decrease is also the marginal social
cost, since it represents society’s forgone consumption.108 Oates and
Schwab conclude that “competition among jurisdictions is thus condu-

105 See W. Baumol & W. Oates, supra note 7, at 291 (discussing simplified version of the
model).
106 Oates & Schwab, supra note 97, at 342.
107 Id. at 341-42.
108 Id. at 342.

The international trade literature addresses problems similar to those studied by Oates
and Schwab. Consistent with the view that international trade is motivated, at least in part, by
the comparative advantage of some nations, or the existence of economies of scale, see Paul R.
Krugman, Rethinking International Trade 1-8 (1990), the literature considers these factors as
well as the effect of tariffs. See, e.g., Ralph C. d’Arge & Allen V. Kneese, Environmental
Quality and International Trade, 26 Int’l Org. 419 (1972); Kerry Krutilla, Environmental Reg-
ulation in an Open Economy, 20 J. Envtl. Econ. & Mgmt. 127 (1991); Rudiger Pethig, Pollu-
tion, Welfare, and Environmental Policy in the Theory of Comparative Advantage, 2 J. Envtl.
Econ. & Mgmt. 160 (1976).

In Krutilla’s model, a nation’s production of a commodity is sufficiently large to affect the
world price; the policy instrument for environmental control is taxes rather than command-
and-control standards. See Krutilla, supra, at 128. The model shows that if there are no
tariffs, a nation will impose suboptimally high environmental taxes (and therefore will induce a
suboptimally stringent level of environmental quality) if it is a net exporter of a “pollution
externality” good (a good for which the production process generates pollution), but will set
suboptimally lax taxes (and, consequently, induce a suboptimally lax level of environmental
quality) if it is a net importer of such a good. See id. at 132. The reason for this result is that
when a nation imposes a tax, the domestic supply of the good decreases, and the world price
cive to efficient outcomes.” Thus, there is no race to the bottom.

The situation is different, however, if jurisdictions choose to tax capital. They might do so, for example, because they cannot finance the provision of public goods through a non-distortionary tax, such as a head tax. If jurisdictions do tax capital, environmental standards will be suboptimally lax because the jurisdiction will continue to relax the standards beyond the optimal level in order to attract the additional tax revenue that results from attracting additional capital.

A net exporter therefore benefits, but a net importer suffers. See id. at 132-33.

The Krutilla model appears implicitly to assume that firms are immobile. It does not consider the effect of higher environmental taxes on industrial location.

A concurring opinion in a case involving the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§ 9601-59, revealed an intuition consistent with the Oates and Schwab conclusion:

Any fears that states will engage in a “race to the bottom” in their effort to attract corporate business and enact laws that limit vicarious liability are in my opinion groundless. States have a substantial interest in protecting their citizens and state resources. Most states have their own counterparts to CERCLA and the EPA and they share a complementary interest with the United States in enforcement of laws like CERCLA that are used to remedy environmental contamination. I see no necessity to create federal common law in this area to guard against the risk that states will create safe havens for polluters.

In deriving this result, Oates and Schwab initially assume that the residents of each jurisdiction are identical in terms of both their preferences and their productive capacities. Then, competition yields the socially efficient result regardless of whether the decisions on tax rates are made by the median voter or a governmental actor seeking to maximize the residents’ welfare. See Oates & Schwab, supra note 97, at 338-39 & n.10.

They then consider situations in which the preferences are not homogeneous. If the majority of the individuals in one jurisdiction are wage earners, but a minority derives no income from wages, the median voter (a wage earner) will favor a subsidy to capital and suboptimally stringent environmental standards. Workers prefer to increase their wages by subsidizing industry rather than by relaxing environmental standards, because part of the burden of higher taxes is borne by individuals without wage income. See id. at 347.

If, in contrast, the majority of the individuals are not wage earners, but a minority is, the median voter (in this case, not a wage earner) will favor a tax on capital because the cost will be borne by workers in the form of lower wages. Oates and Schwab have not been able to show how the corresponding environmental standards compare generally to those in the jurisdiction in which wage earners are in the majority. See id. at 348 & n.15. It appears that, on the one hand, non-workers would favor more stringent environmental standards because the impact is felt solely by workers in the form of lower wages. On the other hand, however, stringent environmental standards would create incentives for firms to leave the jurisdiction, thereby reducing tax revenues.

While Oates and Schwab do not address the issue explicitly, it follows from their analysis that if the choice of taxes and environmental standards is made by a public decisionmaker seeking to maximize social welfare rather than by the median voter, these problems would not arise. The decisionmaker would avoid the problem of one group imposing costs on the other, and would pick the optimal tax and environmental protection levels, even where a jurisdiction’s population is not homogeneous.

Id. at 342-43.
In their model, Oates and Schwab assume that capital does not require the provision of public services, such as roads, and police and fire protection. If it does, the optimal tax rate on capital, rather than zero, is the rate that exactly covers the cost of these services. It follows from the preceding discussion that, for this rate of taxation, jurisdictions would set environmental standards at the optimal level. If, in contrast, the tax on capital is set at a rate higher than that needed to meet the public service demands of capital, environmental standards will be suboptimally lax.

A corollary, not explored by Oates and Schwab, is that environmental standards will be suboptimally stringent if, for whatever reason, a jurisdiction picks a tax rate on capital that is less than the cost of the public services that capital requires. The reason for this result is that the jurisdiction will continue to strengthen the standards beyond the optimal level in order to induce capital to move elsewhere and thereby not continue to impose net costs on the jurisdiction in the form of subsidized public services.

C. Lessons from the Theoretical Literature

The conclusions that emerge from this review of the theoretical literature point strongly against race-to-the-bottom claims. Tiebout, Fischel, and Oates and Schwab all conclude, in situations progressively more analogous to the problem of this Article, that interstate competition is not inconsistent with the maximization of social welfare. There are no formal models supporting the proposition that competition among states creates a prisoner's dilemma in which states, contrary to their interests, compete for industry by offering progressively laxer standards.

The central insight of the Oates and Schwab study is that jurisdictions that seek to maximize their social welfare will not set suboptimally lax environmental standards. It follows from their analysis that no improvements would result from the imposition of federal standards. In

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112 Id. at 337 & n.6.

113 As is explained in more detail below, the Oates and Schwab discussion of a jurisdiction choosing a positive net tax rate is not to the contrary because it concerns a jurisdiction that chooses to act suboptimally, rather than one that is driven to a suboptimal outcome by interstate competition. See text accompanying note 114 infra.

Oates and Schwab point to only two works in the local public finance literature, both by John Cumberland, consistent with the race-to-the-bottom claim. See Oates & Schwab, supra note 97, at 334. But Cumberland’s articles, far from setting forth a supporting theoretical model, focus on issues not directly analogous, such as interstate externalities, undervaluation by states of the benefits of pollution control, and market-based approaches to pollution control. See John H. Cumberland, Efficiency and Equity in Interregional Environmental Management, 10 Rev. Regional Stud. 1 (1981); John H. Cumberland, Interregional Pollution Spillovers and Consistency of Environmental Policy, in Regional Environmental Policy: The Economic Issues 255 (Horst Siebert et al. eds., 1979).
fact, if the federal standards were different from the ones that each jurisdiction would have chosen by itself, there will be a social loss resulting from the federal intervention.

Their conclusion that environmental standards will be suboptimally lax if states set taxes on capital, however, requires further discussion. While this result appears to be consistent with race-to-the-bottom arguments, in fact it is not. Recall from the discussion in Part I and the example in Part II that the race-to-the-bottom argument was premised on the assumption that states seek to maximize social welfare but find themselves in a prisoner's dilemma.

In the Oates and Schwab model, if states seek to maximize social welfare, they should set the net tax rate on capital at zero. Then, despite interstate competition, social welfare will be maximized. Thus, if those same states set a positive net tax rate on capital, inducing interstate competition that leads to suboptimal results, the outcome is due to an "error" on the part of state regulators rather than to a structural failure of state autonomy in a federal system. It is true that once states choose to set a positive net tax on capital, interstate competition will lead them to set suboptimally lax environmental standards as a means of attracting industry. But, here, unlike in traditional race-to-the-bottom scenarios, a but-for cause for the loss in welfare is the state's failure to act in an economically rational manner.

A state that sets a positive net tax on capital is undervaluing the benefits of environmental regulation. The reason might be that the beneficiaries of environmental regulation have difficulty understanding the amount of the benefit conferred upon them, whereas tax revenues are more tangible. Alternatively, the potential benefits of environmental regulation might be concentrated among those who are not successful at protecting their interests through the political process. These latter two arguments, however, are versions of the public choice claim that advocates of environmental quality are more successful with federal than with state institutions, and the arguments thus have no bearing on the race-to-the-bottom question.1

Even if one were prepared to classify the problem of positive net tax rates under the rubric of the race to bottom, one would still need to de-

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114 Conversely, a state that gives capital a net subsidy is overvaluing the benefits of environmental regulation. For example, it is highly plausible that a state would undervalue the benefits of income maintenance programs because their beneficiaries are often politically powerless. As a result, it would unduly sacrifice such programs, and, therefore, use part of its tax revenues to subsidize industry, thereby allowing more stringent environmental standards. Federal environmental regulation that, on race-to-the-bottom grounds, made these standards even more stringent would lead to a further reduction of taxes. The result would be a further decline in social welfare, rather than the increase that race-to-the-bottom arguments would suggest.
termine whether states in fact impose suboptimally high tax rates on capital. There is an extensive literature on whether local property taxes are nondistortionary benefit taxes or user fees on public services received by the property owners or, whether, instead, they are distortionary taxes on capital that are borne primarily by the owners of capital. But neither the theoretical nor the empirical work points clearly in one direction.

One should not overstate the nature of my claim against race-to-the-bottom justifications for environmental regulation. The fact that there are no models consistent with race-to-the-bottom claims does not rule out the possibility that further research will yield such models. Modeling, by necessity, involves making strong sets of assumptions. The Oates and Schwab work, which has studied the problem in the most systematic way, is no exception. A theoretical literature evolves as assumptions are relaxed, often one at a time. It is certainly conceivable that the next generation of theoretical work will provide support for race-to-the-bottom arguments. But the fact remains that race-to-the-bottom arguments in the environmental area have been made for the last two decades with essentially no theoretical foundation.

IV

THE IMPLICATIONS OF THE ENVIRONMENTAL RACE TO THE BOTTOM

Having shown in Part III that the race-to-the-bottom hypothesis, though influential, lacks a sound theoretical basis, this Part shows that


116 See Mieszkowski & Zodrow, supra note 115, at 1107-19 (discussing theoretical work); id. at 1127-31 (discussing empirical work).

117 Traditional economic models, like the Oates and Schwab model, assume that production functions exhibit constant returns to scale. See Oates & Schwab, supra note 97, at 337. A recent working paper departs from this tradition by assuming increasing returns to scale. See James R. Markusen et al., Noncooperative Equilibria in Regional Environmental Policies When Plant Locations Are Endogenous 3, 25 (National Bureau of Economic Research Working Paper No. 4051, 1992). Depending on the specifications of the relevant parameters, their model can yield either suboptimally high or suboptimally low levels of pollution. See id. at 1-2, 25-26.
even if there were such a race in the environmental arena, federal regulation would not necessarily be an appropriate response. The analysis centers on two important consequences of race-to-the-bottom arguments in favor of federal environmental regulation. First, if the premises underlying the race to the bottom hold, federal environmental regulation will have undesirable effects on other state regulatory or fiscal interests; the supposed benefits of federal environmental regulation should therefore be balanced against these undesirable effects. Second, logic compels the conclusion that arguments in favor of federal environmental regulation are a frontal challenge to federalism, because the problems that they seek to correct can be addressed only by exclusive federal regulatory and fiscal powers. Both these consequences, which have been unexplored in the literature, ought to cast even more doubt on the validity of race-to-the-bottom arguments for federal environmental regulation.

Race-to-the-bottom arguments appear to assume, at least implicitly, that jurisdictions compete over only one variable—in this case, environmental quality. So, jurisdictions that would choose to have stringent environmental quality standards in the absence of interstate competition adopt less stringent standards as a result of such competition, and, consequently, suffer a reduction in social welfare.

Consider, instead, the problem in a context in which states compete over two variables—for example, environmental protection and worker safety. Assume that, in the absence of federal regulation, State 1 chooses a low level of environmental protection and a high level of worker safety. State 2 does the opposite: it chooses a high level of environmental protection and a low level of worker safety protection. Both states are in a competitive equilibrium: industry is not migrating from one to the other.

Suppose that federal regulation then imposes on both states a high level of environmental protection. The federal scheme does not add to the costs imposed upon industry in State 2, but it does in State 1. Thus, the federal regulation will upset the competitive equilibrium, and unless State 1 responds, industry will migrate from State 1 to State 2. The logical response of State 1 is to adopt less stringent worker-safety standards. This response will mitigate the magnitude of the industrial migration that would otherwise occur.118

118 The response to such a competitive disadvantage is thus more complex than suggested by Susan Rose-Ackerman's analysis of an analogous problem. She gives the example of state minimum wage laws, which produce capital flow to states that have not enacted such laws. She argues that residents of states with minimum wage laws will urge the adoption of federal minimum wage laws as a way to impose costs on states that do not have minimum wage laws and thereby to gain a competitive advantage. See Rose-Ackerman, supra note 25, at 160. This competitive advantage will be reduced, however, when, in the face of federal intervention, states that had not previously adopted minimum wage laws reduce other costs that they impose on industry.
Thus, federal environmental standards can have adverse effects on other state programs. Such secondary effects must be considered in evaluating the desirability of federal environmental regulation. Most importantly, the presence of such effects suggests that federal regulation will not be able to eliminate the negative effects of interstate competition. Recall that the central tenet of race-to-the-bottom claims is that competition will lead to the reduction of social welfare; the assertion that states enact suboptimally lax environmental standards is simply a consequence of this more basic problem. In the face of federal environmental regulation, however, states will continue to compete for industry by adjusting the incentive structure of other state programs. Federal regulation thus will not solve the prisoner’s dilemma.

Consider an example in which State 1 and State 2, as island states, would impose high levels of both environmental protection and worker safety. When placed in a competitive situation, they respond in the different ways set forth above: State 1 chooses a low level of environmental protection and a high level of worker safety, whereas State 2 does the opposite. After the adoption of federal regulation, they both end up with high levels of environmental protection but low levels of worker safety; their social welfare has therefore been reduced by competition despite federal environmental regulation.

One might respond to these arguments by saying that worker safety should also be the subject of federal regulation. But states would then compete over minimum wage laws, fair labor standards, and so on. It is difficult to imagine a federal system in which all the regulatory requirements that impose costs on industry are mandated at the federal level.

Suppose, however, that this were the case. States impose burdens on industry not only through regulation but also through taxes, which fund a variety of state programs and functions. So, if all regulatory programs are federalized, states still will be able to compete through their fiscal powers. Consider, now, an example in which State 1 and State 2, as island states, would impose both stringent regulatory standards and high corporate taxes. When placed in a competitive situation, State 1 chooses stringent regulatory standards and low corporate taxes, whereas State 2 does the opposite. If the federal government then requires stringent regulatory standards, State 2 will respond by lowering its taxes, and by, say, decreasing the size of its income maintenance programs. This reduction is a direct by-product of the federal regulatory scheme.

Thus, even if all regulatory functions are federalized, federal regula-

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119 If one believes that corporate taxes are undesirable, on the ground perhaps that it is preferable to tax directly the income of shareholders, one might favor federal regulation that forces states to compete over corporate taxes, rather than over regulatory requirements.
tion will continue to have an adverse effect on other issues of state concern—in this example, social welfare programs. Moreover, such a scheme will not eliminate the reduction in social welfare that results from competition among the states.

The next logical step, of course, is to suggest preemption of state taxes, because otherwise the supposedly evil effects of interstate competition will persist. The race-to-the-bottom rationale for federal environmental regulation is, therefore, radically underinclusive. It seeks to solve a problem that can be addressed only by wholly eliminating state autonomy. The prisoner’s dilemma will not be solved through federal environmental regulation alone, as the race-to-the-bottom argument posits. States will simply respond by competing over another variable. Thus, the only logical answer is to eliminate the possibility of any competition altogether. In essence, then, the race-to-the-bottom argument is an argument against federalism.

V

A TAXONOMY OF RACES TO THE BOTTOM

My challenge to race-to-the-bottom arguments in the environmental context does not extend to races to the bottom in all areas of law, although it does apply, more generally, whenever states impose costs on the physical assets of mobile firms to promote the welfare of their citizens. Unfortunately, the legal literature has included under the race-to-the-bottom rubric a variety of problems that are analytically distinct, even though they all involve competition among states to attract economic activity. By discussing the nature of alleged races to the bottom over corporate charters and bank charters, this Part explains the differences among various races, proposes a taxonomy, and advocates abandoning the race-to-the-bottom label altogether. In light of these differences, this Article should not be seen as a general indictment of federal regulation designed to cure problems traditionally defined in race-to-the-bottom terms.

A. Principal-Agent Problems: The Case of Corporate Charters

The most comprehensive legal literature on the race to the bottom is directed at the problem of state chartering of corporations. There is a

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120 Such a scheme would help states that have naturally attractive characteristics, such as proximity to water.

121 Recent evaluations of the desirability of federalism include Competition Among States and Local Governments: Efficiency and Equity in American Federalism (Daphne A. Kenyon & John Kincaid eds., 1991); Thomas R. Dye, American Federalism: Competition Among Governments (1990).
longstanding debate about whether state competition for corporate charters is socially desirable. The beginning of this debate can be traced to the work of William Cary, who argued that state competition for charters creates an undesirable race in which states offer legal regimes that are attractive to corporate managers who are responsible for reincorporation decisions, permitting them to enrich themselves at the expense of shareholders.\textsuperscript{122} To remedy this race to the bottom, Cary advocated federal standards.\textsuperscript{123}

Ralph Winter responded that market forces discipline the decisions of managers by penalizing them if they seek to hurt shareholder interests: incorporation decisions that decrease corporate value make the firm a more desirable target for takeovers, as well as a more likely candidate for bankruptcy, and therefore imperil managers' jobs, lower managers' compensation, and hurt managers' job prospects.\textsuperscript{124} On Winter's assumptions, states will offer the charter provisions that are most beneficial to shareholders. The race is thus a race to the top (to socially desirable outcomes), rather than to the bottom. According to Winter, federal intervention is undesirable because federal regulators are unlikely to do as well as market forces in designing the optimal chartering arrangements.\textsuperscript{125}

More recently, Lucian Bebchuk has argued that there are some areas in which market discipline is likely to align the interests of managers and shareholders sufficiently such that state chartering is desirable and federal involvement unnecessary, but that there are other areas in which the opposite is likely to hold.\textsuperscript{126}

The race for corporate charters is conceptually different from the race in the environmental area. Most importantly, in the corporate area,

\begin{footnotes}
\item[123] Id. at 700-03.
\item[125] Winter, supra note 124, at 290-92. The preceding discussion reveals that the two sides of the corporate chartering debate agree on important issues: that states compete for corporate charters by offering provisions that are attractive to corporate decisionmakers, that the socially desirable arrangements are those that maximize shareholder wealth, and that the desirability of federal chartering depends on whether state competition in fact maximizes shareholder wealth.
\item[126] See Bebchuk, supra note 124, at 1458-84.
\end{footnotes}
the problem alleged by race-to-the-bottom advocates is the principal-agent problem that arises between managers and shareholders when managers make decisions about where to incorporate. Except for this principal-agent problem, however, the corporate literature does not point to any problems caused by the competition among states for corporate charters. In contrast, race-to-the-bottom arguments in the environmental area do not refer to any principal-agent problems between managers and shareholders in deciding where to locate a plant, even though commentators have suggested that such problems exist. Instead, they focus on a posited prisoner's dilemma among the states.

The two literatures can be classified by reference to the two-by-two matrix in Table II. It shows that the defects to be corrected by federal

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127 But see id. at 1485-95 (arguing that certain provisions that maximize shareholder wealth are not socially desirable because they impose externalities on other groups, such as creditors).
129 There are other formal differences between the corporate and environmental races to the bottom. First, the corporate literature assumes that the purpose of chartering provisions is merely to raise funds, and not to enhance the interests of in-state shareholders. Indeed, the race-to-the-bottom argument implies that if a state tried to create a desirable climate for shareholders, it would lose incorporation business to other states, and its in-state shareholders would therefore not receive the intended protection. Thus, states do not consider the tradeoff between their interest in attracting firms and in protecting their shareholders.

In contrast, state environmental laws affect the welfare of in-state breathers, at least if the breathers are locationally immobile. Thus, states must engage in a tradeoff between the benefits of attracting industrial activity and the costs that such activity imposes on in-state breathers. Another difference is that moving an industrial plant from one state to another, unlike changing the state of incorporation, entails substantial costs. The presence of such moving costs can make it possible for states to impose suboptimally stringent environmental standards.

The corporate problem bears some resemblance to the problem that states would face in engaging in economic redistribution if their residents were mobile. Wealthy individuals would have an incentive to move to jurisdictions that did not engage in redistribution, and poor individuals would move to jurisdictions that did. But then, of course, there would be no money in the latter jurisdictions to redistribute, and these jurisdictions would be unable to achieve their goals. See, e.g., Gary J. Miller, Cities by Contract: The Politics of Municipal Incorporation 97-99, 163-89, 196-202 (1981); David F. Bradford & Wallace E. Oates, Suburban Exploitation of Central Cities and Governmental Structure, in Redistribution Through Public Choice 43, 51-60, 65-71, 84-86 (Harold E. Hochman & George E. Peterson eds., 1974); Susan Rose-Ackerman, Beyond Tiebout: Modeling the Political Economy of Local Government, in Local Provision of Public Services: The Tiebout Model After Twenty-Five Years 55, 73-74 (George R. Zodrow ed., 1983). Redistribution is thus more likely to be imposed at the federal level. In the corporate problem, jurisdictions would similarly be frustrated, as a result of a different mobility phenomenon, if they attempted to protect in-state shareholders.

Second, interstate competition over corporate chartering is a zero-sum game for the states. Corporations either incorporate in one state or another, and they pay their fees and take their legal business only to the state in which they incorporate. Thus, federal regulation cannot help all of the states interested in competing for charters; in fact, if the federal intervention takes the form of federal chartering rather than mandatory standards, the states will lose this business altogether. In the environmental area, in contrast, the race to the bottom posit a prisoner's dilemma, in which all states lose as a result of competition, and in which they all could benefit from federal regulation.
regulation can arise either in the locational decisionmaking process of private actors or in the competitive process among states. Race-to-the-bottom advocates in the corporate literature fit in Box 2: they believe that locational decisions are defective but that the competitive process among the states is not.130 Race-to-the-bottom advocates in the environmental literature fit in Box 3: they believe that the competitive process is defective but that locational decisions are not. Thus, the two literatures do not deal with analogous issues.

### TABLE II

**CORPORATE AND ENVIRONMENTAL RACES TO THE BOTTOM**

<table>
<thead>
<tr>
<th>Firm Defective</th>
<th>Interstate Competitive Process</th>
<th>Not Defective</th>
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<tbody>
<tr>
<td>Locational Decision Not Defective</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Locational Decision Defective</td>
<td>3</td>
<td>4</td>
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</table>

**B. Interstate Externalities: The Case of Bank Charters**

Henry Butler and Jonathan Macey argue that state chartering of banks gives rise to a “destructive ‘race to the bottom.’”131 They maintain that the major cause for this race is that the Federal Deposit Insurance Corporation (FDIC) charges banks a deposit insurance premium that is independent of the banks’ risk of default.132

For two distinct reasons, states then have an incentive to set suboptimally lax regulatory regimes.133 First, if a state’s sole interest is in attracting banks and thereby obtaining chartering fees and legal business, it will offer the regulatory regime most attractive to bank shareholders, who will naturally prefer to make risk choices that are unconstrained by any such regime.134 Second, if a state’s sole interest is in promoting the interests of in-state depositors, it also will provide a lax regulatory re-

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130 Competition among the states can exacerbate the principal-agent problem by increasing the opportunity for managerial enrichment. Nonetheless, if the principal-agent problem could be corrected, interstate competition would not have undesirable effects.


132 See id. at 680, 712, 714.

133 Butler and Macey do not distinguish between these reasons, and it is not clear which forms the basis for their argument. See id. at 712-17.

134 As indicated below, this literature does not consider the possibility of principal-agent problems between bank managers and shareholders. At least when a bank’s net worth declines to a point at which it is vulnerable to regulatory sanctions, however, bank managers can be expected to share shareholders’ preferences for risk.
gime. If banks can engage in riskier activities, they may pay depositors higher interest rates. If the risky projects fail, the depositors are protected by FDIC insurance. Thus, depositors capture the benefits of higher risk but do not bear any of the costs. In any event, given the possibility of making deposits across state lines, depositors will bank in the state that offers the laxest provisions, independent of their state of residence.\footnote{135}{The problem, under either formulation, is different from the alleged race to the bottom that arises from the existence of a choice between federal and state chartering. See Kenneth E. Scott, The Dual Banking System: A Model of Competition in Regulation, 30 Stan. L. Rev. 1, 12-13 (1977) (quoting Arthur Burns). For a view that this competition is beneficial, see Daniel R. Fischel et al., The Regulation of Banks and Bank Holding Companies, 73 Va. L. Rev. 301, 335 (1987).}

The undesirable effects in both instances are caused by the presence of an interstate externality.\footnote{136}{Races to the bottom premised on interstate externalities are also said to exist in the products liability area. Michael McConnell argues that states have an incentive to enact pro-plaintiff provisions to favor their residents at the expense of out-of-state manufacturers. See Michael W. McConnell, A Choice-of-Law Approach to Products Liability Reform, in New Directions in Liability Law 90, 91 (Walter Olson ed., 1988). While the resulting race is toward more stringent product liability rules, it can appropriately be characterized as a race to the bottom because it produces a decrease in social welfare. Bruce Hay responds by pointing out that such a state will find its laws invoked not only by resident consumers against nonresident manufacturers but also by nonresident consumers suing resident manufacturers. As a result, there is a restraining force that pushes states toward the socially optimal standards. See Bruce L. Hay, Conflicts of Law and State Competition in the Product Liability System, 80 Geo. L.J. 617 (1992). For further discussion of these issues, see Richard Neely, The Product Liability Mess: How Business Can Be Rescued from the Politics of State Courts 57-79 (1988); Michael H. Gottesman, Draining the Dismal Swamp: The Case for Federal Choice of Law Statutes, 80 Geo. L.J. 1, 43-44, 49 & n.169 (1991).}

Butler and Macey argue that this problem would be cured if the FDIC imposed appropriately risk-adjusted rates.\footnote{137}{See Butler & Macey, supra note 131, at 714-15.} Then, bank shareholders would maximize their returns by choosing the optimal level of risk: additional risk would not be worth the additional insurance premium.\footnote{138}{Butler and Macey write: Risk-adjusted insurance rates would prevent the possibility of a destructive "race to the bottom." Whenever a state adopted regulations (such as granting new bank powers, increasing lending limits, or lowering reserve requirements) that threatened to increase the risk of failure of banks operating under its laws, banks chartered by that state would suffer from higher deposit insurance premiums. Id. at 715.}

In the environmental context, I noted that race-to-the-bottom justi-
fications for federal regulation are distinct from externality-based justifications. I thus use the term “race to the bottom” in the environmental area to refer exclusively to the destructiveness of interstate competition for industry that is alleged to occur even in the absence of interstate pollution externalities. The banking literature, in contrast, refers to only one problem, rather than two, and assumes that the problem would be corrected by eliminating the externality.

The distinction between the two literatures is illustrated in Table III. It shows that the defects to be corrected by federal regulation can arise either from interstate externalities or from the competitive process among states. Banking race-to-the-bottom advocates fit in Box B: they believe that there are interstate externalities but that the competitive process among the states is not otherwise flawed. The environmental race to the bottom, as distinguished from the problem of interstate pollution externalities, fits in Box C. These literatures therefore also do not deal with analogous issues, even though they both make use of the race-to-the-bottom label.

### TABLE III

**Banking and Environmental Races to the Bottom**

<table>
<thead>
<tr>
<th>Interstate Externalities</th>
<th>Interstate Competitive Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Defective</td>
</tr>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>B</td>
</tr>
<tr>
<td>No</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>D</td>
</tr>
</tbody>
</table>

As Table III shows, defects in the competitive process might exist not only with respect to a state’s attempts to attract polluting firms but also with respect to its attempts to attract banks. Note also that while the banking literature addresses a problem different from that addressed in the corporate literature, the former could learn from the latter: just as there is a principal-agent problem when corporations decide where to incorporate, so, too, there could be a divergence of interests between bank managers and shareholders over the bank chartering decision.

### C. Implications of the Taxonomy

I have isolated three different types of problems addressed by race-to-the-bottom theorists: (1) defects in the interstate competitive process, (2) divergence of interests over locational decisions between principals, and (3)...
and their agents, and (3) interstate externalities. The environmental, corporate, and banking literatures have focused, respectively, on one problem each, and have attached to that problem the race-to-the-bottom label. Given the analytic differences discussed above, it would be helpful to abandon the conclusory label and focus instead on the underlying causes of the socially undesirable results. At the very least, it is important to recognize the distinct nature of the problems.

This taxonomy helps to define the scope of my project. The analysis is relevant not only to whether states compete for the location of industrial plants by offering firms suboptimally lax environmental standards, but also to whether interstate competition leads to socially undesirable results in other regulatory programs or in the setting of tax rates. My challenge to race-to-the-bottom arguments in the environmental area applies with equal force whenever states impose costs on the physical assets of mobile capital to promote the welfare of their citizens.

CONCLUSION

This Article should not be read as a definitive refutation of race-to-the-bottom arguments in the environmental area. It is intended, instead, to question the underpinnings of such arguments and to suggest that the forces of interstate competition, far from being conclusively undesirable, are at least presumptively beneficial. If this project proves successful, it will be followed, without a doubt, by studies attempting to define specific circumstances in which federal regulation could improve upon the results of interstate competition.

The development of the race-to-the-bottom literature in corporate law has followed a similar pattern. The first generation, exemplified by William Cary, equated interstate competition over corporate charters with undesirable social outcomes. The second generation, led by Ralph Winter, took the diametrically opposite view. A third generation, exemplified by Lucian Bebchuk, has generally accepted the presumptive benefits of competition but has defined conditions under which competition would fail to produce the socially optimal outcome.

This Article does second- and third-generation work. Just as Ralph Winter pointed out that market forces discipline the decisions of managers, it argues that the costs imposed by industrial pollution (not just the benefits that derive from industrial location) are relevant to state de-

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140 This problem could be described as an externality as well, but I believe that it is conceptually clearer to place it in a different category.
141 See notes 122-23 and accompanying text supra.
142 See notes 124-25 and accompanying text supra.
143 See note 126 and accompanying text supra.
144 See text accompanying note 124 supra.
cisions. Just as the subsequent literature in the corporate area had to accept the fact that the race-to-the-bottom argument had overlooked a concededly relevant factor, the same should be true in the environmental area and, more generally, in all areas involving state regulation of economic activity.

Moreover, in a third-generation vein, this Article suggests some specific instances in which interstate competition, though generally beneficial, nevertheless might not work properly—for example, as a result of the existence of public choice problems at the state level—but it resists the automatic pinning of the race-to-the-bottom label on such competitive failures. Extensions of existing theoretical models will undoubtedly lead to further third-generation studies.