Introduction to the Political Economy of Environmental Regulations

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INTRODUCTION
TO
THE POLITICAL ECONOMY
OF ENVIRONMENTAL REGULATION

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ABSTRACT

This paper introduces a volume of collected papers on the political economy of environmental regulation: economic analyses of the processes through which political decisions regarding environmental regulation are made, principally in the institutional context found in the United States. Despite this geographic focus, many of the papers contain analytical models that are methodologically of interest and/or have lessons that are relevant in other parts of the world. In the environmental realm, questions of political economy emerge along three fundamental dimensions, which are closely interrelated but conceptually distinct: (1) the degree of government activity; (2) the form of government activity; and (3) the level of government that has responsibility. The first three parts of the book deal respectively with these three fundamental dimensions of inquiry. Part I features a set of six articles that examine how the targets and goals of individual environmental policies are established. Part II brings together nine articles that employ the analytical apparatus of positive political economy to address questions related to the choice of policy instruments for environmental regulation. Part III features four articles that examine — both positively and normatively — the level of government that is delegated responsibility for environmental protection. Finally, in Part IV, three articles are featured that assess the use of economic analysis in contemporary environmental policy.

INTRODUCTION TO THE POLITICAL ECONOMY OF ENVIRONMENTAL REGULATION

Robert N. Stavins*

The first task in assembling a collection of papers is to specify the scope of the volume. Although readers will agree about what is meant by "environmental regulation," the meaning of "political economy" may be less clear. Indeed, the meaning of this phrase has changed considerably over time (Oates and Portney 2003). At one time, it denoted the entire realm of the study of economics, but since early in the last century it has come to refer to a sub-field, namely the study — from the perspective of economics — of the processes through which political decisions are made. That provides a fair statement of the scope of this volume — economic analyses of the processes through which political decisions regarding environmental regulation are made, principally in the institutional context found in the United States. Despite this geographic focus, however, many of the papers contain analytical models that are methodologically of interest and/or have lessons that are relevant in other parts of the world.

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has responsibility. The first three parts of the book deal respectively with these three fundamental dimensions of inquiry. Part I features a set of six articles that examine — from a political economy perspective — how the targets and goals of individual environmental policies are established. Part II brings together nine articles that employ the analytical apparatus of positive political economy to address questions related to the choice of policy instruments for environmental regulation. Part III features four articles that examine — both positively and normatively — the level of government that is delegated responsibility for environmental protection. Finally, in Part IV, three articles are featured that assess the use of economic analysis in contemporary environmental policy.

Setting the targets and goals of environmental policies

The fundamental theoretical argument for government activity in the environmental realm is that pollution is a classic example of an externality. Because firm-level decisions systematically fail to take into account full social costs, pollutant emissions tend to be greater than socially efficient levels. As environmental quality is naturally under-provided by competitive markets, a possible role arises for government regulation. Private negotiation will not internalize such externalities adequately without government intervention, and exclusive reliance on judicial remedies is demonstrably insufficient to the task.[1] Since the time of the first Earth Day in 1970, which we may take as the beginning of the modern era of environmental

[1]Externalities in the environmental realm are *not* bilateral, but involve public goods with multi-party impacts. Transaction costs and third-party impacts preclude the possibility of private negotiation consistently leading to simple, efficient solutions (Coase 1960). For largely the same reasons, private tort litigation — with its considerable transaction costs — cannot solve the bulk of environmental problems.

policy, industrialized countries throughout the world have relied mainly upon a combination of legislative and administrative procedures to foster improvements in their natural environments.

If it is appropriate for government to be involved in environmental protection, how intensive should that activity be? In real-world environmental policy, this question becomes, "How stringent should our environmental goals and standards be?" For example, in the United States, should sulfur dioxide (SO_2) emissions be reduced by 10 million tons, or would a 12 million ton reduction be better? In general, how clean is clean enough? How safe is safe enough?

Most economists would argue that economic efficiency — measured as the difference between benefits and costs — ought to be one of the major criteria for evaluating proposed environmental, health, and safety regulations.[2] From an efficiency standpoint, the answer to the question of how much regulation is enough is quite simple — regulate until the incremental benefits from regulation are just offset by the incremental costs. In practice, of course, the problem is much more difficult, in large part because of inherent challenges in measuring marginal benefits and costs.

Over the years, policy makers have sent mixed signals regarding the use of benefit-cost analysis, which assesses policies on the basis of the efficiency criterion. Congress has passed several statutes to protect health, safety, and the environment that effectively preclude the consideration of benefits and costs in the development of certain regulations, even though other

[2]See: Arrow, Cropper, Eads, Hahn, Lave, Noll, Portney, Russell, Schmalensee, Smith, and Stavins (1996).

statutes actually require the use of benefit-cost analysis.[3] But this has not prevented regulatory agencies from considering the benefits and costs of their regulatory proposals.

At the same time as Congress has sent mixed signals regarding the use of economic analysis in environmental policy assessment, Presidents Carter, Reagan, Bush, Clinton, and Bush all introduced formal processes for reviewing economic implications of major environmental, health, and safety regulations (using so-called Regulatory Impact Analysis). Apparently the Executive Branch, charged with designing and implementing regulations, has seen a greater need than the Congress to develop a yardstick against which the efficiency of regulatory proposals can be assessed; benefit-cost analysis has been the yardstick of choice.

Despite such arguments, formal benefit-cost analysis has only infrequently been used to help set the stringency of environmental standards. The politics of environmental policy have favored a very different set of approaches to setting standards, such as that embraced by the Clean Air Act: set the standard to "protect the public health with an adequate margin of safety."

Part I of this volume features six articles that develop and apply the tools of positive political economy to provide insights into how the targets and goals of environmental policies

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[3]Statutes that have been interpreted (in part, at least) to restrict the ability of regulators to consider benefits and costs include: the Federal Food, Drug, and Cosmetic Act; health standards under the Occupational Safety and Health Act; safety regulations from National Highway and Transportation Safety Agency; the Clean Air Act; the Clean Water Act; the Resource Conservation and Recovery Act; and the Comprehensive Environmental Response, Compensation, and Liability Act. On the other hand, parts of the Clean Water Act, the Consumer Product Safety Act, the Toxic Substances Control Act, the Federal Insecticide, Fungicide, and Rodenticide Act, and the Safe Drinking Water Act explicitly allow or require regulators to consider benefits and costs.

have been established, with particular attention to the U.S. institutional context over the period since the 1970s.[4]

In the first article in Part I, Joseph Kalt and Mark Zupan (1984) provide an empirical analysis of "Capture and Ideology in the Economic Theory of Politics." By the early 1980s, public interest theories of regulation, in which politicians were assumed to make decisions simply and exclusively to benefit the public, were already out of favor, having been replaced by "interest group" or "capture" theories whereby politicians were modeled as making decisions to maximize their own political support, typically as provided by interest groups within their constituencies (Downs 1957; Stigler 1971; Buchanan and Tullock 1965; Peltzman 1976). In the context of the latter literature, Kalt and Zupan argue that the ideological preferences of policy makers, not just their constituents' economic or other self interests, may also play a significant role in determining legislative and regulatory outcomes.

Following Stigler (1972), Kalt and Zupan distinguish two types of utility that an elected official may be expected to seek: utility derived from increased wealth or likelihood of re-

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[4]The six articles included in Part I of this volume are not intended to represent a comprehensive review of the literature in this area. Among other works that are important are the following: Stigler (1971) provided the original exposition of capture theory, which was subsequently formalized and extended by Peltzman (1976). Becker (1983) followed by explaining political outcomes as the consequence of competition among interest groups, adding the wrinkle that such political competition could be efficiency enhancing. In early empirical analyses, Crandall (1983), Pashigian (1985), Elliot, Ackerman, and Millian (1985) found evidence that self-interest could explain patterns of regulation, a view that received further empirical support from Hird (1990). Hahn (1990) stepped back from empirical analysis to develop further the theoretical framework within which the political economy of environmental regulation could be considered. More recent works have included Fredriksson's (1997) model of how pollution tax rates are determined, building upon earlier work by Bernheim and Whinston (1986) and Grossman and Helpman (1994), and a related empirical analysis by Ekins and Speck (1999) of implementation of environmental taxes in Europe.

election (the "investment motive") and utility from acting according to moral or "ideological" beliefs (the "consumption motive"). Stigler believed that the investment motive, satisfied by maximizing constituent support, would be vastly more important in understanding and modeling political behavior. Kalt and Zupan challenge this, hypothesizing that imperfect "policing" of political representatives (agents) by their constituents (principals) might leave politicians room to indulge their own ideological preferences.[5] Through a carefully-constructed econometric analysis of U.S. Senate votes on the Surface Mining Control and Reclamation Act of 1977, the authors find that although the capture model explains a considerable amount of the variation in voting patterns, Senators' ideological preferences are also highly significant.

The second paper turns from Congressional voting behavior to agency rulemaking, and examines the factors — both those associated with special interests and those associated with perceptions of general welfare — that can explain public decision making in the environmental realm. In "The Determination of Pesticide Regulation: A Statistical Analysis of EPA Decision Making," Maureen Cropper, William Evans, Stephen Berardi, Maria Ducla-Soares, and Paul Portney (1992) find empirical support for the proposition that regulators take into account both special interests and general welfare when setting environmental standards.

Although economic efficiency would require that standards be set at the level that maximizes the difference between benefits and costs, this is rarely the approach taken in actual public policy, and there has been considerable scholarly debate over how environmental standards are actually set. Do agencies weigh benefits and costs, or are they driven by the demands of politically influential interest groups? Do agencies take action when risks exceed

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[5]Kalt and Zupan refer to a then-current debate about the empirical importance of public interest or ideological motives, citing: Kau and Rubin 1979, Kalt 1981, Peltzman 1982, and Mitchell 1979.

certain statistical thresholds, regardless of costs (Milvy 1986, Travis *et al.* 1987, Travis and Hattemer-Frey 1988)?[6] Cropper *et al*. (1992) analyze EPA's decision making in an effort to test these alternative theories of standard setting.[7]

In their econometric analysis of EPA's decisions between 1975 and 1989 regarding the registration of pesticides, Cropper *et al.* (1992) test two main hypotheses: (1) that EPA takes into account benefits and costs when setting standards, and so the probability that EPA will cancel the use of a pesticide is influenced by relative benefits and costs; and (2) that special interest groups representing business and the environment also affect the likelihood of cancellation decisions. They find that EPA does appear to balance the risks of pesticide use against the benefits of continuation, but they also find that EPA places much greater weight on risks to pesticide applicators (farm-workers) than risks to consumers: the implicit value of a statistical life is $35 million per cancer case for pesticide applicators, but only $60 thousand for consumers! The authors do not find evidence supporting the "bright lines" hypothesis, but do find that political intervention by environmental groups and growers affects policy outcomes.

The third paper in Part I stands back and considers the role of broader political institutions in setting environmental goals by comparing how the presence of authoritarian versus democratic government affects choices of environmental targets. In "Political Institutions and Pollution Control," Ronald Congleton (1992) posits a model of national decision-making related to environmental standards, and with it demonstrates that anticipated differences in parameters between authoritarian and democratic regimes affects national choices of pollution control.

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[6]Such thresholds have been termed "bright lines."

[7]At the time of their writing, there had been only one other such *ex post* analysis of EPA decision making (Magat, Krupnick, and Harrington 1986).

Under plausible assumptions about regime preferences, Congleton demonstrates that autocrats place a higher relative cost on pollution abatement than democratic (median voter) regimes. Hence authoritarian regimes tend to choose more lax environmental standards. Congleton carries out an empirical test using data on signatories to the Montreal Protocol, and finds general support for his theory.

In the fourth paper in Part I, "Patterns of Behavior in Endangered Species Preservation," Andrew Metrick and Martin Weitzman (1996) carry out an empirical analysis of factors that affect U.S. government decisions regarding the protection of endangered species. The authors do not specify a formal political economy model, but provide a reduced-form analysis of factors that affect government decision-making.[8] Metrick and Weitzman posit two sets of explanatory variables: "scientific" characteristics and "visceral" characteristics, the former including degree of endangerment and taxonomic uniqueness, and the latter including size of species and phylogenic class, intended to proxy for species' status as higher forms of life.

In their econometric analysis, the authors examine the effects of these characteristics on two major types of decisions: (1) whether a species is listed by the Federal government as threatened or endangered; and (2) the amount the government directly spends on the recovery or preservation of the species. The authors examine differences between observed patterns and the stated goals of the U.S. Fish and Wildlife Service's own priority system, which is intended to guide listing and spending decisions. Metrick and Weitzman find that the role of visceral characteristics plays a significant role in government decisions, with considerable favoritism being shown to the preservation of "charismatic mega-fauna" (essentially species that are cute

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[8]This work can be seen as an extension of earlier research by McFadden (1975), Weingast and Moran (1983), Thomas (1988), and Cropper *et al*. (1992).

and large). Although scientific characteristics are found to play a role at the listing stage, they are overwhelmed in importance by the visceral characteristics in decisions about spending. In addition, the authors find that political factors (proxied by whether efforts to protect species have been in direct conflict with development projects) have had more influence on listing and spending decisions than is proscribed by the government's priority system.

The fifth paper in Part I — "The Voluntary Provision of a Pure Public Good: The Case of Reduced CFC Emissions and the Montreal Protocol," by James Murdoch and Todd Sandler (1997) — provides a game-theoretic analysis of worldwide reductions in CFC emissions in the late 1980s. At its core, the paper develops a model of the voluntary provision of public goods and provides an empirical test of this hypothesis using data on CFC emissions prior to the beginning of official limits linked with the Montreal Protocol.[9]

In their model, nations' preferences vary according to their tastes, which are a function of factors such as income, geophysical characteristics, population size, and political regime. The quantity of the public good (the ozone layer) is jointly determined by the decisions of each nation, and nations with higher incomes are assumed to contribute more to the provision of the public good. The authors find that the variation in voluntary CFC reductions is explained largely by GNP, political and civil rights, and geographical latitude, and that emissions reduction patterns support their hypothesized model. They conclude that the Montreal Protocol codified emissions reductions that countries would have provided voluntarily.

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[9]Previous literature on the voluntary provision of public goods include: Bergstrom, Blume and Varian (1986), and Cornes and Sandler (1984, 1996). Previous applications of the "subscription model" of public good contributions include: Andreoni (1988), and Andreoni and McGuire (1993).

The sixth and final paper in Part I is by Toke Aidt (1998), "Political Internalization of Economic Externalities and Environmental Policy." Aidt develops a theoretic model of the political economy of environmental regulation, based on the interactions of competing interest groups.[10] The government maximizes its political support, which is modeled as a weighted average of interest group contributions and constituent social welfare. The analysis features a two-stage game, where interest groups first present a menu of political contributions (taking as fixed the contributions of other groups) contingent on policy choices. In the second stage, the government chooses its policy (setting both the target and the instrument) to maximize its objective function. Aidt's contribution is to demonstrate that competition among interest groups results in policies that internalize environmental externalities, but that this political solution generally is sub-optimal.

Choosing the instruments of environmental regulation

Once the goals or standards of any given environmental policy are established (whether on political, scientific, economic, ethical, or any other grounds), policy makers are left to ask what *form* should government involvement take. In other words, what means — what policy instruments — should be used to achieve the established ends? Economists consistently have urged the use of "market-based" instruments — principally pollution taxes and tradeable permits — rather than so-called "command-and-control" instruments, such as design standards, which require the use of particular technologies, or performance standards, which prescribe the

[10]The common agency model employed by Aidt follows the approaches of Bernheim and Whinston (1986), and Grossman and Helpman (1994).

maximum amount of pollution that individual sources can emit. At least in theory, market-based instruments are cost effective, that is, they can minimize the aggregate cost of achieving a given level of environmental protection, and provide dynamic incentives for the adoption and diffusion of cheaper and better control technologies. Despite these advantages, however, market-based instruments have been used far less frequently than command-and-control standards.

Part II of this volume features nine articles that apply positive political economy analysis to the question of how governments select particular policy instruments for environmental protection. The first paper is a seminal one in the field, "Polluters' Profits and Political Response: Direct Controls Versus Taxes," by James Buchanan and Gordon Tullock (1975). The authors follow the public choice framework in assuming that policy outcomes are determined by industry influence, rather than by pure social welfare considerations. The major contribution of the paper is to demonstrate that firms will prefer direct regulation (emissions quotas) over taxes, offering a plausible explanation for the prevalence of command-and-control instruments, despite the known cost-effectiveness of market-based instruments.[11] Quotas that restrict entry create scarcity rents, which firms may appropriate, while taxes reduce the value of a firm.[12]

The second paper in Part II is a direct extension of the Buchanan and Tullock (1975) model. In "A Positive Theory of Environmental Quality Regulation," Michael Maloney and Robert McCormick (1982) extend the earlier work by specifying the conditions under which

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[11]In a widely-cited application of the approach taken by Buchanan and Tullock (1975), Ackerman and Hassler (1981) document the emergence of regulations that required power plants to install scrubbers.

[12]Hahn (1990) notes that Buchanan and Tullock's (1975) analysis is more narrow than the authors claim. They do not actually demonstrate why industry prefers standards over taxes in general, but why industry will prefer a specific type of standard over a specific type of tax.

firms benefit from quantity regulations. Like Buchanan and Tullock (1975), they demonstrate how quantity restrictions create cartel-like situations, allowing scarcity rents to be captured by firms. In particular, Maloney and McCormick derive conditions on the cost structures of firms and on the degree of regulation under which quantity regulations will lead to an increase in aggregate industry profits.[13]

To explore the empirical validity of their theories, the authors test whether specific regulations did in fact enhance the profitability of regulated firms. They employ data on firms affected by the U.S. Occupational, Safety, and Health Administration (OSHA) cotton-dust standards, and by court-mandated rule changes in air quality regulation. Their examination of the rates of return in the stock market on a portfolio of firms in the relevant industries indicates support for their explanation of environmental regulation.

The third paper in Part II is also an extension of Buchanan and Tullock's (1975) seminal work. In "Instrument Choice in Environmental Policy," Donald Dewees (1983) analyzes how instrument choice affects certain groups ("concentrated interests") who are expected to experience significant impacts as a result of a proposed policy. He considers the effects on shareholders and employees of three alternative instruments: an effluent standard (set as a rate of pollution per unit of output); an effluent charge; and effluent rights (essentially a system of tradeable permits).

Dewees finds that both capital and labor suffer more from effluent rights or effluent charges than from uniform effluent standards. Furthermore, charges and permits look even

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[13]In addition, the authors note that some firms may lobby for regulation even if it does not benefit the industry as a whole. Essentially, firms who can comply most cheaply with the regulation stand to gain a competitive advantage over higher-cost firms.

worse when compared with regulatory regimes that impose more stringent standards on new plants than on existing plants (so-called vintage-differentiated regulations). This result — which is consistent with Buchanan and Tullock (1975) — does not hold under all conditions, and Dewees' major contribution is to show for which conditions (with respect to factor specificity, initial allocations of permits, differential treatment of old and new firms) these results hold.

The fourth paper in Part II represents a departure from the first three in its empirical focus and informal approach. In "Economic Prescriptions for Environmental Problems: How the Patient Followed the Doctor's Orders," Robert Hahn (1989) provides one of the earliest and still one of the most frequently-cited reviews of experience with market-based instruments for environmental protection (with specific focus on tradeable permit systems and pollution charges).[14] Hahn finds that actual practice has diverged considerably from the textbook instruments envisioned by theorists. Further, he concludes that for this reason, the cost savings have not lived up to expectations.

Hahn provides a variety of explanations for these departures, which include political economy factors that produce less-than-optimal design of instruments. For example, he notes that the cost-effectiveness of tradeable permit systems is reduced by the presence of any barrier to trading activity, and many such barriers (linked with location, trading ratios, and property rights definitions) are best understood as the result of interest group pressure. Hahn argues for a richer conceptualization of the political economy factors affecting instrument choice.[15]

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[14]For a more recent review, see Stavins (2003).

[15]He notes, for example, that whether standards will be preferred to taxes depends upon the precise nature of each set of instruments (Coelho 1976, Yohe 1976, Dewees 1983).

In the fifth paper in Part II, "Taxes, Torts, and the Toxics Release Inventory: Congressional Voting on Instruments to Control Pollution," James Hamilton (1997) raises an additional factor to consider in the political economy of instrument choice: the degree of public scrutiny given to a particular legislative decision. Earlier theories of the positive political economy of Congressional voting decisions held that the economic interests of members' constituencies and the ideology of constituents or members could have significant explanatory power (Ackerman and Hassler 1981, Crandall 1983, Kalt and Zupan 1984, Pashigan 1985, Yandle 1989). Hamilton moves beyond this by noting that it is not just the final vote on a bill that is important. Rather, earlier rounds of voting on amendments, which typically include choices regarding instruments, may be important but are unlikely to be highly visible to the public. Hence, the Congressional votes on amendments are more likely to be influenced by concentrated interests with significant lobbying power, rather than broad constituent interests.[16]

Hamilton's empirical test examines voting on amendments to the reauthorization of the Superfund law in 1985. These amendments called for specific instruments in separate votes: information-provision; a targeted tax on chemical and petroleum producers to fund the program; and liability rules. Through his empirical analysis, Hamilton finds broad support for the notion that votes on these instruments were more affected by concentrated special interests than the overall vote on the Superfund bill, in which broad constituent interests and ideology had greater effects. He concludes that it is important to consider the type of vote and level of public scrutiny when examining Congressional decisions on environmental policy, including the choice of instruments.

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[16]The notion of "rational political ignorance" has been attributed to Downs (1957). Also see Arnold (1990).

In the sixth paper in Part II, "The Political Economy of Market-Based Environmental Policy: The U.S. Acid Rain Program," Paul Joskow and Richard Schmalensee (1998) examine the factors affecting the allocation of permits in a marketable rights scheme. In particular, they analyze the allocations for Phase I (1995-1999) and Phase II (2000-2009) of the sulfur dioxide (SO_2) allowance trading program under the Clean Air Act amendments of 1990. They examine how the actual allocation differed from a number of allocations under hypothetical rules, and seek to explain the difference, drawing upon theories from positive political economy.

Overall, Joskow and Schmalensee find that the allocation of allowances in the acid rain program suggests "both a more complex and more idiosyncratic pattern of political forces than one might expect from previous work on the political economy of clean air." While interest group politics, Congressional influence, and electoral politics all appear to have played important roles in the allocation process, the final distribution of allowances suggests that the legislative process is simply more complex than has been captured by available models.

The seventh paper in Part II, "The Choice of Regulatory Instruments in Environmental Policy," by Nathaniel Keohane, Richard Revesz, and Robert Stavins (1998), provides a survey and synthesis of the positive political economy of environmental policy instrument choice. The authors begin by noting the great divergence in this realm between the recommendations of normative economic theory and positive political reality. In particular, they highlight four anomalies. First, despite the advantages of cost-effectiveness and dynamic efficiency associated with market-based policy instruments, these approaches to environmental protection have been used to a minor degree, compared with conventional, command-and-control instruments. Second, pollution-control standards have typically been much more stringent for new than for existing sources (vintage-differentiated regulation), despite the well-known inefficiency of this approach. Third, in the few instances in which market-based instruments have been adopted, they have nearly always taken the form of tradeable permits allocated without charge, rather than

auctioned permits or pollution taxes, despite the advantages in some situations of these other instruments. Fourth, the political attention given to market-based environmental policy instruments has increased dramatically in recent years.

In their search for explanations for these four apparent anomalies, Keohane, Revesz, and Stavins draw upon intellectual traditions from economics, political science, and law. They find that all fit quite well within an equilibrium framework, based upon the metaphor of a political market. The authors develop their "market model" of the supply and demand of environmental policy instruments. In general, explanations from economics tend to refer to the demand for environmental policy instruments, while explanations from political science refer to the supply side. Overall, the authors find that there are compelling theoretical explanations for the four apparent anomalies, although these theories have not been empirically verified.

In the eighth paper in Part II, "Toward a Political Theory of the Emergence of Environmental Incentive Regulation," Marcel Boyer and Jean-Jacques Laffont (1999) provide an analysis of instrument choice that emphasizes the principle-agent problems inherent in the design of regulatory mechanisms.[17] In a world of perfect information, instruments are equivalent, but the realities of incomplete information necessitate consideration of contracting problems between the public and regulators. Boyer and Laffont develop a formal political economy model that compares two stylized instruments: a uniform standard and a more flexible instrument that varies the standard among firms. In contrast with standard theory, they identify conditions under which the uniform standard is more efficient than the flexible policy.

The ninth and final paper in Part II, "No Chance for Incentive-Oriented Environmental Policies in Representative Democracies? A Public Choice Analysis," is authored by Friedrich

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[17]Previous work in this vein on the regulation of natural monopolies was by Loeb and Magat (1979).

Schneider and Juergen Volkert (1999). This paper examines political economy explanations for the relative prevalence of command-and-control and market-based instruments, relying on the public choice approach. The authors find that it is difficult to implement market-based environmental regulations for a variety of reasons, including the following. First, firms — which prefer command-and-control instruments, for the reasons put forward by Buchanan and Tulloch (1975) — have relatively great lobbying power because they can overcome collective action problems more easily than environmental interests. Second, voters may not favor an environmental program unless they are well-informed about it, and incentive-based policies are more difficult to understand. Third, politicians favor policies that get immediate results and postpone the costs (or make them less visible to voters), and command-and-control policies lead to more immediate results that voters can see easily, while making their costs less transparent. Fourth, bureaucrats responsible for implementing environmental policies prefer command-and-control approaches because they give them a more important role, and allow them to maximize their own budgets and staff.

Setting the level of government to be delegated responsibility

Inseparable from the first two questions is this third aspect of the overall inquiry into the role of government in environmental protection. What *level* of government should be delegated responsibility and authority: local, state, regional, Federal, multinational, or global? There is no single, correct answer. Even from a relatively narrow economic perspective, the answer depends upon specific characteristics of individual environmental policy issues.

What I have defined as the beginning of the modern era of environmental policy, the time of the first Earth Day in 1970, is also the beginning of major involvement by the Federal government in the United States in environmental protection. At that time and since, three sets of arguments have been made in favor of a strong Federal role: (1) that in the absence of national

controls, states would compete economically by lowering their environmental standards in a so-called, "race to the bottom;"[18] (2) that many environmental problems are inter-state externalities, and as such cannot be efficiently regulated by individual states; and (3) that a set of other factors, many linked with public choice arguments, also indicate the necessity of strong, national supervision.

Part III of this volume features four articles that examine the level of government at which environmental policies are developed and implemented. The first paper in Part III, "Environmental Governance in Federal Systems: The Effects of Capital Competition and Lobby Groups," by Per Fredriksson and Noel Gaston (2000), examines the optimal level of government at which to make decisions regarding environmental regulation. The striking claim of the Fredriksson and Gaston paper is that environmental regulation is independent of the level at which it is set.[19] In their model,[20] centralized and decentralized governance lead to equivalent environmental regulations.

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[18]The view of inter-jurisdictional competition as beneficial received early support from Tiebout's (1965) analysis demonstrating that people's ability to choose their locations could result in the efficient provision of public goods. Brennan and Buchanan (1980) suggest that competition among regions may constrain the taxing power of public agents, forcing them to be more fiscally responsible. On the negative side of the decentralization (or federalism) issue, important early arguments for the so-called "race to the bottom" are found in Break (1967), Cumberland (1979), and Cumberland (1981). Other important analyses include Crandall (1983), Pashigan (1985), and Oates and Schwab (1988). A recent overview of the literature is provided by Oates (2002).

[19]The conclusion that the level of government authority makes no difference contrasts both with normative arguments for the need for Federal standards, such as to avoid a "race to the bottom" (Cumberland 1981), and with counter arguments that Federal regulations tend to be inefficient because of their inability to take into account regional differences (Burtraw and Portney 1991). The conclusions also contrast with those of Oates and Schwab (1988).

At the same time, the authors recognize that there are important distributional differences. In the decentralized case, the full costs of regulation are borne by workers, whereas in the centralized case, the costs are shared by workers and the owners of capital. The authors present empirical evidence that is consistent with their theory, including an analysis of voting behavior on environmental policies in state legislatures, the U.S. House of Representatives, and the U.S. Senate. They find no significant differences in the level of support for environmental policies at the different levels of government.

The second paper in Part III, "Regulatory Federalism and Environmental Protection in the United States," by John List and Shelby Gerking (2000), refutes the hypothesis that letting regions (states) determine environmental policies will necessarily result in a "race to the bottom." The authors carry out an empirical analysis that leads to two conclusions. First, greater environmental quality in a state responds positively to increases in income. Second, while it has frequently been argued that granting more power to states will result in a race to the bottom in environmental quality, List and Gerking do not find compelling evidence that environmental quality declined when states had more control over setting rules for environmental protection. Specifically, they examine the results of the Reagan era's federalism policies.

The third paper, "Federalism and Environmental Regulation: A Public Choice Analysis," by Richard Revesz (2001), challenges the claim that environmental regulation should be carried out at the Federal (national) level because environmental interests are systematically under-represented at the state levels. Revesz develops his argument both theoretically and empirically. Like List and Gerking (2000), Revesz challenges the view that states are ineffective as

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[20]Their political model is similar to the one developed by Aidt (1998), and follows Grossman and Helpman (1994). Politicians maximize a weighted average of contributions and general welfare.

environmental regulators. He demonstrates that there were significant accomplishments at the state level prior to the initiation of Federal activity in 1970, and that the states have continued to undertake significant environmental protection measures, including ones that go beyond Federal requirements. He asks why some states are more aggressive in this regard than others, and argues that the most plausible explanation is that states differ in their preferences for environmental protection.

Revesz is careful to point out that his conclusions regarding state-level environmental regulation do not imply: that the states enact socially optimal (efficient) environmental regulations; that state environmental regulation is likely to lead to higher levels of national welfare than Federal regulation; or that state governments are subject to less serious public choice constraints than the Federal government. Rather, his major point is that the arguments that are typically put forward in support of primary reliance on the Federal government for environmental regulation — such as those that claim under-representation of environmental interests at the state level — are themselves theoretically flawed and empirically incorrect.

The fourth and final paper in Part III, "Strategic Interaction and the Determination of Environmental Policy Across U.S. States," by Per Fredriksson and Daniel Millimet (2002), takes a different approach than previous researchers to examine the race to the bottom hypothesis. The authors note two reasons why state-level environmental policies have been claimed to be inefficient: the presence of transboundary pollution problems; and competition for capital. But, as the authors note, such arguments assume implicitly the existence of strategic policymaking at the state level. Thus, Fredriksson and Millimet set out to test the empirical validity of this assumption.

The authors' empirical strategy employs two measures of state-level stringency of standards in econometric analyses that seek to examine whether one state's environmental standards are dependent upon the standards in other states. Their finding, in brief, is that there

are strategic interactions, that is, states are influenced by the actions of their neighbors, but the weight of the evidence suggests a "race to the top," not a "race to the bottom."

Assessing the use of economic analysis in environmental policy

Part IV of this volume brings together three papers that assess the use of economic analysis in the development and implementation of environmental policy. In the first of these, "The Impact of Economics on Environmental Policy," Robert Hahn (2000) examines the historical impact of economic thinking on environmental policy in the United States. He observes that over two decades, interest has grown in market-based environmental policy instruments and benefit-cost analysis of proposed and enacted policies. Hahn finds that economists have influenced environmental policy in three ways: by advocating the use of particular policy instruments; by developing improved methods to analyze benefits and costs; and by analyzing the political economy of environmental policies.

His overall assessment is that "despite a few notable successes, the influence of economists on environmental policy to date has been modest." While the economic approach has gained significant traction in the policy community, this has not translated directly into better public policies. The reason is that real-world policy formulation faces severe political economy constraints, which affect both design and implementation of instruments and the process of economic analysis. Because of this, Hahn argues that it is critical for economists to improve their understanding of the political constraints, so that they can help design public policies that are both feasible and more efficient.

The second paper in Part IV, "From Research to Policy: The Case of Environmental Economics," by Wallace Oates (2000), is a retrospective analysis of the influence of economics

on thirty years of U.S. environmental policy. Oates notes that in the early years of environmental policy, economists already had well-developed theories of externalities, but these had little influence in the policy world. Oates maintains that the economic perspective on environmental management had little influence on the major legislation of the early 1970s because: first, there was no interest group for which economic prescriptions had much appeal; second, environmental economics was itself a new field and had not yet focused on the complexities of design and implementation of market-based instruments; and third, there was a general lack of understanding in the policy community of the economic approach to environmental protection. Subsequently, however, there was what the author characterizes as a "remarkable transformation," both with regard to targets and with regard to instruments. The system evolved from one which ignored costs and relied exclusively on direct controls to one which explicitly considers benefits and costs and gives considerable attention to market-based instruments.[21]

The third and final paper in Part III, "Environmental Regulation During the 1990s: A Retrospective Analysis," by Robert Hahn, Sheila Olmstead, and Robert Stavins, provides a retrospective analysis of environmental regulation in the 1990s, examining environmental policy making during that decade from the perspective of economics. The paper focuses on the Clinton Administration, and highlights important trends and changes in the impacts of economic thinking. The authors begin with a review of environmental quality changes during the 1990s, and then focus their discussion around three themes: efficiency, cost-effectiveness, and distributional equity.

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[21]Oates (2000) highlights the research contributions of Dales (1968) and Weitzman (1974) to increased knowledge of the potential advantages of tradeable permits, as well as Tietenberg (1985) for demonstrating the cost-effectiveness of market-based instruments.

First, they highlight the ways in which the role of efficiency as a criterion for assessing environmental and natural resource regulations was very controversial in the Clinton Administration, while efficiency emerged as a central goal of the regulatory reform movement in the Congress. Second, they examine how cost-effectiveness was embraced by both the Administration and the Congress in the 1990s as a criterion for adopting specific policy instruments. Third, they analyze how and why the decade witnessed an increasing role for equity concerns as a consideration in environmental policy-making. They contend that both the efficiency and the cost-effectiveness criteria may be hard to swallow when the distributional impacts of regulation are highly skewed, and that the focus on equity in environmental policy debates is likely to intensify as the costs and benefits of regulation continue to rise.

Thus, this volume brings together twenty-two papers that have contributed to the scholarly literature on the political economy of environmental regulation. The publication dates of these twenty-two diverse papers range from 1975 to 2003, and the topics are spread across four areas: setting targets and goals; choosing instruments; setting the level of government; and assessing economic analysis. But all the papers in this volume have in common their focus on economic analyses of the processes through which political decisions regarding environmental protection are made.

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