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Environmental Policy Reform: A Taxonomy of Economists' Perspectives

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ABSTRACT

As the environmental policy recommendations of economists become more acceptable, differences in the professional understanding of, and support for, different policy forms are becoming more apparent. These different approaches to environmental policy and research are described around a taxonomy of four perspectives: "rational analysts," "cost analysts," "market managers," and "free market environmentalists." These perspectives are compared and contrasted. Recognition of these differences can result in a better appreciation of the different research agendas of economists and can improve clarity in teaching and policy advising.

Key Words: economic incentives, environmental policy, regulation.

The numerous environmental laws put into place around the time of the first Earth Day addressed many environmental concerns. The laws designed to reduce waste discharges to air, land, and water adopted what has been characterized as "command and control" regulation.¹ In simplest terms, command and control regulation requires uniform waste discharge reduction performance, by a common technological approach, for all regulated sources. Technology-based and uniform-performance waste reduction requirements are written into individual discharge permits (Ackerman and Stewart 1988). For example, a common level of pollutant concentration achieved by employing similar wastewater treatment technologies would be expected at all pub-

licly owned wastewater treatment plants. These similar waste control requirements are imposed on discharge sources without close consideration of the differences in waste discharge control costs.

These laws have been an environmental success. Most air and water quality indicators have improved since the early 1970s. This is a significant accomplishment, considering the increases in population and economic activity that occurred during the same time. However, in recent years, the command and control regulatory approach has been criticized. One theme of the critics is that environmental regulations that are inflexible and insensitive to individual circumstances will result in higher than necessary cost for achieving environmental goals (Stavins et al. 1988, 1991). A second criticism is that command and control regulation will do little to advance pollution control technology in the face of continuing economic and population growth.

Economists, who have made these same criticisms for many years (Kneese and Schultze), generally recommend creating economic instruments for reduction of waste discharge. Consequently, they reject any approach that specifies how much any

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¹ The remainder of this paper addresses waste discharge from point sources. Environmental concerns related to non-point source waste discharge, to landscape alteration, and to habitat and species management are not discussed or used as examples here. However, the framework presented and the issues discussed can be applied to these areas.

source must reduce its waste or how that reduction would be accomplished.² The basic environmental economics literature describes two different forms these economic instruments can take (Tietenberg 1994). The "Coasian" approach defines an "ideal" market where there are two uses for the environment: waste disposal and non-waste disposal (recreation, production input, etc.). If waste generators are assigned the rights to the environment, other users purchase the waste disposal rights in order to increase non-waste disposal services. Under a different rights assignment, waste generators would pay others for the right to dispose of wastes. The payments in either direction are the "price" of waste disposal uses for the environment.

The second form of economic instruments could be called an "administered price signal." In this approach, a governmental body creates a price signal through the administration of a subsidy/charge or tradable quota system. An agency, for instance, might offer a subsidy to a discharger if it ceases its waste disposal behavior. The failure to withhold waste is a "price" on waste disposal equal to the foregone subsidy payment. Alternatively, a regulatory agency might impose a per unit charge on waste generating behavior. Another type of price creation system is one that assigns a predetermined financial liability to a waste discharger for a damage to third parties. Although damage payments are not made until harm has occurred, the possibility of such payments provides an incentive to take measures that reduce waste disposal. A transferable (tradable) quota or allowance system is an alternative to administratively setting a charge or subsidy on waste disposal (Tietenberg 1985; Hahn and Stavins). A limited number of rights to discharge waste are made available, consistent with meeting a politically determined environmental quality outcome. These rights are assigned to waste dischargers to be traded among them. Limits on allowable discharge allowances (or quotas) and a trading process set the price of a right to discharge.

Many of these policy prescriptions are now increasingly accepted. The early interest in these policies was encouraged by a nonpartisan study ef-

fort, "Project 88," sponsored by Senators Timothy Wirth (D-Colorado) and the late John Heinz (R-Pennsylvania) (Stavins et al. 1988, 1991). The influence of the Project 88 arguments on political leadership was immediate. For example, during the Bush administration, Environmental Protection Agency (EPA) administrator William Reilly argued that "to maintain progress toward our environmental goals, we must move beyond a prescriptive [command and control] approach by adding innovative policy instruments such as economic incentives" (U.S. EPA 1991).

Some environmental groups, which had long been antagonistic toward the economist's environmental policy prescriptions (Shabman 1984), became proponents. For instance, the Environmental Defense Fund (EDF) was instrumental in the design and acceptance of the nutrient trading system for North Carolina's Tar-Pamlico river basin (Rader), and regularly advocates the use of allowance trading programs under the Clean Air Act (*EDF Letter*). More recently, President Clinton's administration announced that it would increase reliance on market-based solutions to decide how to clean up the environment (U.S. EPA 1995). One of the first bills introduced under the new Republican leadership of the House of Representatives (H.R. 9) called upon federal agencies to "employ market-based mechanisms that permit greatest flexibility in achieving benefit" (U.S. Congress, House).

Economists are now asked to move from textbook theory to policy-relevant research and advising. In this effort, they are discovering differences in the professional understanding of, and professional support for, varying forms of economic instruments. This has led to debates over the environmental economics research agenda and over the appropriate policy advice to be offered by environmental economists.³ However, differences of view are not well recognized or understood among most economists. Our purpose is to describe these differences and their professional implications. Our discussion is organized around a taxonomy describing four economic perspectives on environmental

² These economic instruments are often called "market-based" or "incentive-based" environmental policies.

³ For example, refer to the January 1995 issue of *Contemporary Economic Policy* for several articles illustrating this point.

policy: "rational analysts," "cost analysts," "market managers," and "free market environmentalists." Individual economists' views may not fit neatly into one of the categories, but the stark contrasts we draw will serve to highlight important and fundamental differences in professional views. Recognition of these differences will result in a better appreciation of economists' diverse research agendas as well as an improved clarity in teaching and policy advising.

Alternative Economic Perspectives

The Rational Analyst

Rational analysts are those economists who advocate economic efficiency as a dominant concern in the development of environmental goals and who believe that the best choice among command and control and the different approaches to putting a price on waste disposal can be determined by benefit/cost analysis techniques. The rational analyst makes an efficiency calculation before recommending an environmental quality goal and the instrument to achieve the goal. The rational analyst might favor economic instruments in principle, but admits command and control to the suite of policies that are considered for this empirical evaluation.

Rational analysts begin an evaluation by assuming some initial assignment of responsibility for pollution reduction. The step of assigning financial responsibility for the cost of waste discharge control directs the choice of policies. For instance, if it is decided the polluter should bear the responsibility of reducing effluent discharge (i.e., polluter pays), then command and control or an emission tax, but not a subsidy, would be an acceptable policy. The assignment of financial responsibility is equivalent to the assignment of property rights as a precondition to determining the appropriate measure of economic surplus for benefit assessment (willingness to pay versus willingness to accept compensation) (Schmid). With these initial conditions established, the analysts can move to the central activity of benefit/cost analysis. The benefit/cost analysis yields recommendations for two related dimensions of the environmental management problem: the efficient level of environmental qual-

ity and the policy instruments to achieve that efficient level.

The analyst envisions a wide array of states of nature (e.g., ambient water quality in a stream) associated with waste discharge from high levels to zero discharge.⁴ Each of these water quality states has a money equivalent value to the people who find their utility increased by changes in the environmental condition. The analyst sets out to make money equivalent measures of these different utility levels—benefits—from different reductions in waste disposal. Next, the costs for achieving each of the different benefit levels are measured. To compute costs of different policies, rational analysts envision a response function relating a given policy approach (command and control, charge, subsidy, discharge allowance trading, or "Coasian-like" bargaining) to waste disposal behavior and waste disposal costs. Costs include outlays for waste generators' capital, operation, and legal and information costs for compliance with the policy regime.

Another cost is the foregone value of market output (opportunity cost) that might rise with increased levels of waste discharge reduction. As a general matter, most economists believe that these costs are higher under command and control regulation than under incentive-based policies. The logic of this conclusion has made its way into undergraduate textbooks (Tietenberg 1994), but the magnitude of the cost difference is an empirical question for the rational analyst.

A third cost category includes information, monitoring, and enforcement costs to implement and administer different forms of command and control and incentive-based policies. These costs have received less attention from economists, but also must be made a part of the rational analyst's benefit/cost computation.

Analytical barriers of time, data, and study resources may prevent a complete benefit/cost analysis. Still, the rational analyst would (at least in concept) want to strive for the combination of the level of waste reduction and policy strategy that yields the greatest measured net benefits (i.e., is the most

⁴ A response function relating waste reduction to environmental quality is assumed to be available.

efficient) in order to make environmental policy recommendations.

The Cost Analyst

Cost analysts are wary of the benefit measurements of the rational analysts. While they believe that more research will advance the state of the art, they feel that current technical limitations make reliance on benefit measures for policy advocacy professionally indefensible. These economists might support the introduction of empirical benefit estimates into the public debate over the selection of the "appropriate" level of environmental quality, but reluctantly concede that selection of an environmental goal is a decision for the political process.

Therefore, cost analysts view environmental decision making as a two-stage process.⁵ In the first stage, decisions are made on desired environmental goals and waste discharge reduction, as well as on the assignment of responsibility for achieving these goals (Stavins et al. 1988; Ackerman and Stewart 1985, 1988). Examples of environmental goals set through political processes include the federal no-net-loss of remaining wetlands and the 40% nitrogen and phosphorous reduction goal established for the Chesapeake Bay.

The second-stage policy question is: "How are we to best achieve our environmental goals?" This second stage is where the cost analysts focus their professional attention. The primary policy objective of these economists is to assure that the environmental goals are achieved by those sources with the lowest measured marginal cost of waste reduction. With this in mind, the analyst conducts intensive empirical cost-effectiveness studies for the whole range of policy options, including command and control, administered price, and Coasian systems. Taking the environmental objectives as largely given, the cost analyst's quantification of costs is conducted the same way as the rational analyst's cost analysis. A comprehensive cost analysis would take into account not only pollution control

costs, but also transaction and public costs (Stavins). The cost analyst's recommendations for choice among an entire set of economic policy instruments will be based on the outcomes of the cost measurement studies.

The Market Manager

Market managers, like cost analysts, see environmental decision making as a two-stage process. In the first stage, political decisions are made on desired environmental goals and on the assignment of responsibility for achieving these goals. Unlike the analysts, however, the market managers are eager to concede the choice of environmental goal to the political process. For them, the selection of the desirable level of environmental quality involves social values that always will escape the benefit calculations. Likewise, market managers do not advocate a particular assignment of waste reduction responsibilities—since this assignment of responsibility is ultimately grounded in the beliefs of members of society as to what is considered equitable.

Market managers focus their professional and policy attention on the second-stage issue of selecting policies to achieve environmental objectives. At this point, the rational analysts, cost analysts, and market managers might all advocate the same set of economic instruments. There is one significant difference in viewpoint, however, which causes market managers to exclusively advocate economic instruments. Market managers emphasize the need to create a continuing incentive for waste dischargers to seek new ways to lower the marginal cost of waste reduction. For this reason, command and control regulation, which may be admitted into the analysts' choice set, is not considered. In command and control, the desire to develop innovative control strategies is muted since the financial incentive to reduce discharges ends once the mandated technology for waste control has been installed and is being operated.

By contrast, if a price on waste discharge is part of the cost of production, then the waste generator will continuously search for innovative waste disposal reduction strategies. Market managers stress this technology-forcing dynamic of financial incentives, over the static economic efficiency result from their use. Therefore, the market managers not

⁵ Current command and control policy also uses the two-part approach of selecting an environmental goal (as a function of desired waste discharge reduction) before designing the performance and technological requirements that will be assigned to each source.

only are unconcerned about benefit measurement, but also are unconcerned with predicting the cost savings that might be achieved under the different instruments. In fact, these economists note that any control cost estimates made before the incentive-based policy is implemented will be too high.

Market managers focus on the designs and the public costs of specialized waste discharge rights markets or charges and subsidies to manage market behavior. They argue that such costs are always worth bearing in order to tap the dynamic power of price incentives. Rather than accept the general designs for such instruments or devote professional energy into cost-estimation techniques, the market manager will devote professional effort into the careful, situation-sensitive design of the instruments. Attention to design means that public implementation costs are minimized, incentive structures are properly constructed, and implementation feasibility/political acceptance is enhanced.

The Free Market Environmentalist

Economists with a fourth perspective, self-labeled as "free market environmentalists," are closely aligned with the public choice/Austrian traditions in economics. These economists believe that the appropriate level of environmental quality (i.e., allocation of the environment among competing uses) can be defined by freely trading individuals (Anderson and Leal). For the free market environmentalist, the instrument of environmental policy is well-defined, enforced, and transferable private property rights for all the services of the environment: waste disposal, aesthetics, factor of production, and life support.

The assurance of nonattenuated rights to all of these services for individuals and groups defines one role of the political process. Once rights are assigned, liability rules based on common law traditions (or new property rules) stimulate market trade for the multiple uses of the environment (Calabresi and Melamed; Landes and Posner). In turn, the uses of the environment are exchanged like typical consumer goods. For instance, if local residential development has been granted property rights to a shared lake, a potential industrial discharge source would have to bargain with the neighborhood association for the right to discharge a certain amount of effluent into the lake. The outcome of this bar-

gaining process among free-trading private individuals will determine the level of environmental quality in the lake. Thus, the role of government is effectively eliminated from environmental goal setting and the selection of pollution control strategies. The focus on private bargaining suggests the appropriate role of governmental process be limited to actions in the definitions of rights and in other arenas that will reduce the costs of transaction.

Comparing the Alternative Perspectives

As the above discussion suggests, there are substantial differences of view among these four economic perspectives on environmental policy. These four perspectives arise from different opinions about three issues: the appropriate role for the political process, the place of calculation in making environmental policy, and the responsibility of economists in detailed policy design. The rational analyst, cost analyst, market manager, and free market environmentalist each holds a unique set of views related to these issues. Table 1 offers a summary of these perspectives.

Both rational analysts and free market environmentalists worry about possible "inefficiencies" of selecting the level of environmental quality in a political process. To a lesser extent, this is a concern of cost analysts. Both groups base their concern on perceived limitations of contemporary democratic processes. The equally fervent subscriptions to rent-seeking theories of political process (Shabman 1995) support this common skepticism of the political process, but do not lead to common solutions.

Rational analysts would restrict political decision makers to implementing the goals and policy instruments identified by a benefit/cost calculation. For them, sound environmental policy cannot be made without such information, and this calls for a research agenda dedicated to measuring and reporting on net benefits. This becomes the profession's most central contribution to environmental policy (Hanemann).

Economists who adopt this perspective will be more comfortable offering advice to decision makers grounded in empirical studies. Indeed, some economists argue that we are currently wasting our professional time on design of incentive-based instruments, because the environmental goals to be achieved by such instruments are ill-advised. They

Table 1. Alternative Economic Perspectives on Environmental Policy

Economic Perspective of Analyst	Role of Political Process in Public Decision Making	Role of Calculation in Public Decision Making	Role of Economist in Formation of Environmental Policy	
			Environmental Goal Setting	Policy Tools/Choice Set
Rational Analyst	Very limited	Emphasis on benefit/cost measurement: static efficiency	Primary	<i>Select appropriate policy tools.</i> Choice set: command & control, administered price systems, Coasian bargaining
Cost Analyst	Limited	Cost measurement: cost effectiveness analysis	Limited	<i>Identify least-cost policy tools.</i> Choice set: command & control, administered price systems, Coasian bargaining
Market Manager	Important/strong	Measurement limited to transactions/public costs: process oriented	Limited	<i>Design price signal mechanism.</i> Choice set: administered price systems, possibly Coasian bargaining
Free Market Environmentalism	Very limited	Measurement unnecessary: process oriented	None	<i>Advocate/design private signaling mechanism.</i> Choice set: Coasian bargaining

believe that such goals can only be changed by more attention to the gains derived in relation to the adverse consequences to the economy. While not all would advocate a comprehensive evaluation of benefits and costs called for by the framework of the rational analyst, rational analysts do want the profession to become vocal in criticizing the goals of current environmental laws (Crandall).

Those holding the free market environmentalist perspective place little faith in calculated benefit and cost numbers. First, they dispute the possibility that those calculating them can be impartial (objective). More than doubt about impartial professional colleagues, however, is at issue. Free market environmentalists do not believe that meaningful benefit estimates are conceptually possible. The search for a stable and precise benefit estimate is misplaced because people's preferences are learned over time and between choice circumstances in response to new experiences and information. In this Austrian view, marginal values cannot be inferred from prices and therefore are not subject to calculation, but instead are discovered and revised through market exchange (Dolan; Baird).

Terry Anderson (1982, p. 933) reflects both concerns in his rejection of the rational analyst perspective because it has "implicitly assumed that knowledge is given and that it will be used by dispassionate, highly organized, and professional technicians." Then, for the free market environmentalist, the evolving values motivate new definitions of property rights and liability rules consistent with the emerging and shifting values for the environment. Property institutions emerge to reflect new values, if the political process does not intrude (Anderson and Hill). Thus, in the end, free market environmentalists believe that appropriate environmental goals can only be defined through individual exchanges made in true market processes, and not in the political arena *or* by rational analysts.

Like the free market environmentalists, market managers reject benefit estimation as a way to quantify people's preferences for alternative uses of the environment. Unlike the free market environmentalists, market managers accept the environmental goals set in the political arena. For market managers, benefits and costs are revised and discovered during the continuing deliberative processes that characterize the political decision-making experience (Lindblom). Market managers would admit all

forms of argument and evidence to a political debate that addresses the merits of extant environmental goals. Indeed, market managers may be sympathetic with the rational analysts' call for a constant consideration of gains and costs from any environmental program, but would argue for reconsideration of environmental goals using economic concepts of opportunity costs and marginal values instead of stressing empirical measurements. Market managers also would advocate that the actual (not estimated) cost of different policies becomes information that feeds back to political decision processes seeking to revise environmental goals.

The free market environmentalist and the market manager both rely on processes instead of calculation to arrive at environmental goals. The difference between the two perspectives centers on what is viewed as the appropriate decision-making process for synthesizing environmental values—individual market choice in one case, or collective choice in the other. The focus on benefit and cost discovery processes in different domains directs the market manager's and the free market environmentalist's research agenda to the details of policy design.

The market manager considers a range of economic policy instruments, but places emphasis on administered price systems such as tradable waste discharge rights and taxes or subsidies to alter the production and consumption decisions over Coasian-type bargaining. Market managers accept and believe in the potential of financial incentives to create a dynamic process of cost reduction to meet political goals. Thus, their policy attention turns primarily to the design and refinement of an institutional framework capable of tapping this dynamic cost-reduction process. Recent attention to the questions of reducing transactions costs and increasing the certainty of waste discharge allowance rights when creating a system of tradable pollution rights (once a politically determined cap on total discharge has been set) illustrates the nature of this concern (U.S. General Accounting Office; Letson).

Free market environmentalists place their emphasis on how to assign certain rights to the environment for *all* uses, not just waste discharge. Then the free market environmentalist focuses design attention to reducing transactions costs among all users of the environment so that an environmental goal arises from trade in all rights to the environ-

ment. The central difference between the two is over the commodity to be traded—a pollution allowance or all rights to use of the environment. Thus, there is a common attention to systems that can reduce transactions costs among buyers and sellers. However, profound differences remain as free market environmentalists reject the policy instruments of charges, subsidies, and pollution allowance markets advocated by market managers.

At one level, free market environmentalists find administered price instruments unworkable. For example, they argue that the political process that controls the number of allowances in a pollution rights trading system always will create uncertainty that will make potential market participants reluctant to exploit the cost-saving potential of an allowance market (Smith; Kellogg). Similar uncertainty about charges and subsidies would be described as barriers to investments in waste reduction technology. While these criticisms are recognized, market managers would respond by suggesting that certainty will improve with better design and more experience.

The more fundamental challenge posed by the free market environmentalists to all three perspectives is the recommendation that environmental goal setting should be entrusted to a full market process. One critic of the policies recommended by the market managers states:

Market-based policies [tradable pollution allowances, charges, and subsidies] essentially are designed to induce companies to reduce pollution in a more efficient manner. However, they do nothing to address the political problems inherent in government-determined environmental quality (Smith, p. 69).

A central role for government is to remove legal and other impediments that stand in the way of creating a more comprehensive set of property rights, and to enforce the outcomes of these bargains. At this point, critics note that many environmental problems do not lend themselves to low cost identification of the bargaining parties or monitoring and enforcement of waste disposal behavior (such as suggested by the lake illustration discussed above). For example, air pollutants come from numerous sources and travel long distances, and so those who might have a right to “clean air” could not readily

secure compensation from those whose waste discharge diminishes the value of the right.

The free market environmentalist might acknowledge the comment, but will suggest that technologies will be developed in response to such problems if the incentives to trade are first put in place by the development of free market environmental policies. As evidence, they cite the enclosure of the western range. As western lands were settled and land became relatively scarce, conflicts arose over use and access of the land. Such conflicts stimulated the creation of a new technological development—barbed wire—to enclose the vast western expanses (Anderson and Hill; Kellogg). In a more contemporary context, Smith suggests that airshed could be privatized through technological developments that allow air emissions for specific sources to be chemically “labeled” and tracked. In this way, if owners of a right to clean air were harmed, they would be able to identify the origin of the pollutant and seek compensation.

Summary and Conclusions

At a general level, economists would all agree that economic instruments are a more desirable way to design environmental programs than traditional command and control. Beneath this general conceptual agreement, however, differences in economic perspectives suggest dissimilar research and policy agendas. Rational analysts and cost analysts align themselves with a research agenda of computation that is reinforced with strong professional recognition of empirical studies. Market managers and free market environmentalists reject this computational mind set and agree that economists must be pro-active in institutional design. Yet, the market managers and free market environmentalists part company on the acceptability of political processes for environmental management decision making.⁶

In the end, different perspectives on the political process yield different research agendas and policy recommendations. Understanding the basis for disagreement will be important for practicing

⁶This particular disagreement stems from a far more basic dispute over the role of government in all areas (Payne).

policy economists who are asked to explain (teach) and provide advice on "incentive-" or "market-based" approaches to environmental policy.

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