

THE POLITICAL ECONOMY OF ENVIRONMENTAL POLICY

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Abstract

This chapter provides a review and assessment of the extensive literature on the political determination of environmental regulation. A promising theoretical literature has emerged relatively recently that provides models of the political interaction of government with various interest groups in the setting of environmental standards and the choice of regulatory instruments. A large empirical literature supports such models, finding evidence of the influence of interest groups but also evidence that net social benefits are often an important determinant of environmental policy choices. A later section of the paper takes up the issue of environmental federalism and the large and growing theoretical literature that addresses the so-called competitive “race to the bottom” as various jurisdictions attempt to use environmental policy as an instrument of economic competition. The evidence on all this is sparse, although some recent work in the U.S. is unable to find any support for the race-to-the-bottom hypothesis. The paper concludes with a brief look at the evolution of environmental policy and finds that economics has come to play a growing role both in the setting of standards for environmental quality and in the design of regulatory measures. There seems to be a discernible trend toward more efficient decision-making for environmental protection.

Keywords

political economy, interest groups, environmental taxes, tradeable permits, command-and-control policies, environmental federalism

JEL classification: Q2, H4, H7

The term “political economy” has a long and rich history. In its earliest manifestations, it meant essentially economics; indeed the two terms were basically synonyms in the nineteenth and early twentieth centuries [Groenewegen (1987)]. However, as “economics” came to denote the discipline, the term “political economy” has come to take on a variety of shades of meaning. It is now, in fact, a rather elusive term that typically refers to the study of the collective or political processes through which public economic decisions are made.

For our purposes in this essay, we shall settle for this admittedly broad and somewhat vague definition. Our concern here is with the determinants of actual decisions on environmental programs. Environmental economics (as the other chapters in this Handbook reveal) has much to say about the design of efficient and effective policy measures for protection of the environment. But when we turn to actual policy, we find, often to our dismay, that existing measures or institutions do not stack up at all well in terms of these guidelines. How are we to understand such “political failure”?

In this chapter, we shall explore the various political, or collective choice, facets of environmental policy-making. Our treatment will focus on the political economy of domestic environmental policy, for there is another chapter by Scott Barrett in this Handbook that takes up the issue of international environmental agreements. In addition, our study is more or less limited to the experience of countries with elected governments – in particular, the United States and the nations of Western Europe. Both existing theory and more rigorous empirical work tend to relate to these countries.¹

We begin the chapter with a few preliminary and general observations on the various theoretical and empirical approaches that have been employed to study regulatory behavior. Our sense is that certain of them are more directly relevant to understanding the determination of environmental policy than others. More specifically, a framework in which various interest groups vie with one another in a political setting seems to us the most promising approach to a positive theory of environmental regulation. In Section 3 we review the fairly extensive theoretical literature that sets forth this approach. This body of work draws heavily on the recent work on the positive theory of international trade, which has developed models of competing interest groups that seek to restrict trade in ways that promote their own interests. The parallels to the determination of environmental policy are straightforward.

The chapter then turns to a survey of the wide-ranging empirical work on the political economy of environmental regulation. This body of research encompasses a vast array of studies that range from largely qualitative, case studies to more formal and rigorous econometric investigations. These studies provide support for the view that not only specific interest groups influence environmental measures, but that (at least in some cases) the social benefits and costs also play a role in determining outcomes.

¹ For a useful study of the political economy of environmental policy in the developing world, see World Bank (2000). David Wheeler and his colleagues at the World Bank provide numerous insights into the complex interaction between economic development and environmental protection with important implications for the design of environmental policies.

Section 5 moves on to a description and assessment of the now vast and rich literature on environmental federalism. The issue of the respective roles of various levels of government is a contentious issue on both sides of the Atlantic. Our sense is that the “race-to-the bottom” arguments that are the basis for current pressures for the harmonization (or centralization) of environmental policies across jurisdictional boundaries are not so compelling as some argue. There are important responsibilities for governments at all levels in the design and implementation of environmental programs. And it is important to get these “functions” aligned properly in the vertical structure of public decision-making. We conclude the chapter with some reflections on trends in the political economy of environmental decision-making – most notably on the encouraging tendency in recent years to give more weight to economic analysis in the design of environmental policy.

1. On theories of regulation: Some preliminaries

There are a number of distinct approaches to understanding regulatory activity. The traditional neoclassical and normative approach sees regulatory measures as one means for correcting allocative distortions in a market system. In the case of environmental policy, the standard theory of externalities provides a basic explanation for tendencies in a market economy toward excessive levels of pollution. From this approach follows a clearcut prescription for correction of this distortion: the internalization of the external costs through either a system of taxes on polluting activities equal to marginal social damage or a system of tradable emission permits that restricts aggregate pollution to the efficient level and, at the same time, guides abatement activities into a least-cost pattern.²

But this is the normative theory of environmental regulation. It emerges from an analytical exercise involving the maximization of social welfare. As such, it presumes implicitly an enlightened public sector that designs and implements social programs for environmental protection with the sole objective of promoting the well-being of the polity as a whole (i.e., some weighted average of individual utilities). This, we know, is not how social policies typically come into being, which leads to the search for positive models that can describe the actual determination of social policy.

One such conceptual construct is the widely employed median-voter model. In this framework, social choices that are made directly by voters or through their elected representatives reflect the median of the most preferred outcomes of the individuals in the

² Alternatively, we may see such public intervention in terms of its capacity to reduce the “transactions costs” associated with achieving an efficient outcome. See, for example, Zerbe, Jr., and McCurdy (1999). As Coase (1960) has shown us, there may well be cases where voluntary negotiations among a small group of affected parties can effectively resolve an externality with no need for public regulatory measures. Or, if the transactions costs are sufficiently low and the link between cause and effect sufficiently clear, a well-functioning tort system that makes polluters liable for the costs they impose on society can constitute an efficient system of pollution control.

relevant social group.³ One familiar and popular adaption [Downs (1957)] extends the model to a setting of two political parties in which competition for votes among these parties leads to outcomes that converge on the preferred outcome of the median-voter. Moreover, as Bergstrom (1979) has shown, under certain conditions, the median-voter outcome will satisfy the first-order conditions for Pareto-efficiency. This is of particular interest, since it provides us with a case where the actual outcome of a plausible process of political decision-making satisfies the conditions from our normative model for efficient social choice. One cannot push this too far, for the Bergstrom conditions for such a coincidence of outcomes are admittedly restrictive; moreover, there are many realistic complications (such as a multi-dimensional policy space) that create serious problems for the model. But in its defense, it has had some success in explaining a substantial range of social choice outcomes.⁴

Let us note one obvious prediction of our normative and median-voter models. Since environmental externalities can involve significant social damages and economic distortions, one would expect policies to emerge to restrict polluting activities – as has been the case in most places. In other words, and at this most simple level, the predictions of models that lead to efficient (or “quasi-efficient”) outcomes find some support in real-world outcomes. But again, we must not push too hard on this. When we ask the harder questions concerning the stringency of these programs and the choice of policy instruments, things quickly become more complex and less clear. But it is worthwhile to note at the outset that our basic normative framework (linked to a positive model through something like the median-voter model) does have some, if limited, explanatory power.

There are other theories of social choice and, in particular, of regulation that are potentially important here. A major (and radical) attempt to provide a positive theory of regulation originated with Stigler (1971) with subsequent development by Peltzman (1976) and others. This approach sees regulation not as a means to promote the general welfare by mitigating efficiency losses from market failure, but rather as a form of wealth transfers. In Stigler’s view, “regulation is acquired by the industry and is designed and operated primarily for its benefit” [Stigler (1971, p. 3)]. This so-called “capture theory” of regulation sees regulated industries, not as the victims of regulatory measures, but rather as their beneficiary. Measures enacted by “captured” agencies may take the form, for example, of direct monetary subsidies or, alternatively, of less direct assistance in the form of barriers to entry into the regulated industry.

³ Black (1948) is the source for the first modern treatment of the median-voter theorem. See Mueller (1989) for an excellent survey of the more recent literature on the median-voter model.

⁴ One such application involves the use of the model to provide a framework for the estimation of demand functions for local public goods [Borcherding and Deacon (1972), Bergstrom and Goodman (1973)]. Assuming that the outcome in each community represents a point on the demand curve of the median voter, this literature has generated plausible econometric estimates of the demand functions for a number of different public services provided by local governments. For surveys that explain this application and describe the findings, see Rubinfeld (1987) and Oates (1996).

While the capture theory may describe some classes of regulatory activity reasonably well, it does not seem to us that it is very successful as a positive theory of environmental policy. As we have suggested, environmental measures come about largely as a result of the real or perceived social damages that are borne quite widely across the social spectrum from polluting activities. A theory that relates regulation directly to social welfare maximization thus does not seem too far off the mark. Environmental measures typically impose costs – sometimes quite significant costs – on the sources of polluting activities. For this reason, it seems misleading at best to describe environmental measures as instigated by regulatees – that is by polluting industries. We surely find certain cases (which we will examine later) where such measures have been manipulated into a form that provides specific benefits to at least some regulatees, but to argue that environmental policy has its basic impetus in the designs of polluting industries seems misplaced.⁵

A more attractive model of environmental regulatory choice is one in which various interest groups vie with one another through a political process to determine the extent and form of environmental policies. The problem with this approach, as Stigler observed, is that such a view can lead to the position that a regulatory outcome “defies rational explanation”, being the result of “an imponderable, a constantly and unpredictably shifting mixture of forces of the most diverse nature” [Stigler (1971, p. 3)].

Fortunately, as Becker (1983) showed in his seminal paper, things are not this intractable. In fact, it is not even the case that such political processes lead invariably to distorted, inefficient outcomes. Becker’s analysis finds that competition among interest groups for political influence can have some important efficiency-enhancing properties. Moreover, some recent work on interest group politics pushes this farther; in the Becker spirit, this work finds that such processes lead to political equilibria that can be economically efficient. Aidt (1998), for example, lays out an interesting model in which competition among interest groups leads to an efficient internalization of detrimental externalities. In Aidt’s model (which we shall examine in more detail later), government pursues its own goals, seeking a mixture of political contributions and social welfare. So long as the interest groups represent the interests of their constituencies faithfully, their contributions induce public decision-makers both to select efficient levels of externality-generating activities and to employ efficient regulatory instruments. Such models at least remind us that the outcomes from the political interplay of diverse interest groups need not be inherently distortionary, although fully efficient outcomes are admittedly special cases.

It seems to us that approaches that explicitly recognize this interaction of different interest groups are the most promising for an understanding of environmental policy. The stage upon which the environmental policy process plays itself out is typically one

⁵ Interestingly, however, it has been argued that the Clean Air Amendments in 1970 in the United States resulted from pressures from industry for federal standards as a means for inhibiting states from setting yet more stringent (and nonuniform) standards! See Elliott, Ackerman and Millian (1985).

in which environmental advocacy groups and potentially regulated parties (which can include corporations, other levels of government, and even individuals) push their cases, and where regulators may even bring to bear basic measures of social costs and benefits.

In this process, it seems clear that institutions matter. Environmentalists, business trade organizations, and other interest groups interact first in the determination of environmental legislation. But this is not the end of the story. The implementation of such legislation by environmental agencies provides another arena in which divergent interests must be reconciled in the actual design, administration, and enforcement of policy. Through the selective enforcement of specific environmental measures, regulatory agencies may either weaken the measures or expand their scope and effectiveness. Some statutes actually allow the regulator to negotiate with the source to determine the form and extent of compliance. Finally, key decisions often end up in the hands of the judiciary, as the courts interpret the intent of legislation and the faithfulness of its implementation by administrative agencies. The analysis of the political economy of environmental policy must thus encompass the institutional setting in which the interplay of interest groups takes place.

2. On the empirical study of the political economy of environmental regulation: A few more preliminaries

To assess the role of different interests in the determination of policy measures, one can look in a relatively informal, historical way at various policy decisions through qualitative case studies. Such studies abound in the literature – and frequently provide valuable insights into the political economy of particular environmental programs. Ackerman and Hassler (1981), for example, provide a penetrating account of the evolution of the Clean Air Act in the United States with particular attention to the crucial role played by coal interests. More recently, Leveque (1996) has assembled a series of case studies in Europe that describe different dimensions of the environmental policy process in the emerging European Union. At the same time, there are available somewhat more formal approaches that allow us to make statistical inferences about the groups or issues that figured significantly in the policy-making process. And these have been widely used in the environmental literature to shed light on how environmental decisions have, in fact, been made.

One such approach examines the “revealed preferences” of the regulatory agency. McFadden (1975, 1976) set forth such a method in which the actual decisions of a public agency can be used to infer the criteria that gave rise to these choices. Making use of a multinomial logit model, the approach essentially selects statistically a set of decision rules that can explain the observed choices. As an application, McFadden used the model to explore the determinants of freeway planning decisions by the California Division of Highways.

More generally, one can posit a relationship between a class of decisions regarding, say, the regulation of a set of industries or pollutants, as the dependent variable and

as explanatory variables the behavior (e.g., contributions, lobbying activities, testifying before regulatory bodies) of various interest groups, along with other factors such as the toxicity of the pollutants and the cost of controlling them. With the needed data, we can then estimate econometrically the impact of each of these determinants on a series of environmental decisions. As we shall see, this general approach has been used quite effectively for the study of a variety of environmental programs – it has allowed us to explore *ex post* who has “called the tune” for various kinds of environmental measures.

An alternative approach involves the examination of voting behavior. Some studies, for example, look at the voting records of individual legislators and then relate these records back to the characteristics of the politicians themselves or their constituencies. In other cases, environmental measures have been determined by direct vote in a referendum; under this form of decision-making, we can look directly at the pattern of votes across precincts and relate these patterns to the characteristics of the voters to find out what effectively determined the outcomes. Thus, we find in the sections that follow a number of different approaches to uncovering the role of various interest groups and decision-making procedures in the setting of environmental policy.

3. Toward a positive theory of environmental regulation⁶

3.1. *The early literature*

As we suggested earlier, the most promising approach to understanding the actual form and stringency of environmental measures appears to us to be one which tries to understand how various interest groups interact in a specified political setting with environmental policies as the outcome. This general approach has its roots in some early pieces that sought to explain why existing environmental policies had taken an inefficient and inferior form rather than the kinds of measures suggested by economic analysis.

In one of these early papers, Buchanan and Tullock (1975), drawing on basic models of the firm, showed that emissions standards (or, more precisely, quotas on polluting outputs) would generally be preferred to effluent taxes by firms themselves, where these measures take a form that effectively limits entry. In such a setting, environmental regulations can produce a cartel-type outcome with increased profits for existing firms. For example, it is easy to see that environmental measures that prescribe more stringent standards for new, than for existing, plants (as is often the case since retrofitting can be quite expensive) may be welcomed by industrial interests as a newly created barrier-to-entry into the polluting industry.

⁶ There is now a substantial literature addressing the political economy of environmental regulation, some, but not all, of which we shall draw on explicitly in our treatment. For five useful books on this issue, see Magat, Krupnick and Harrington (1986), Congleton (1996), Dijkstra (1999), Svendsen (1998), and Wallart (1999).

This general line of analysis was pursued in some subsequent papers. Dewees (1983), for example, laid out very nicely a systematic treatment of how various policy instruments affected the well-being both of industrial interests (including shareholders) and workers in the affected industries. Dewees confirmed and extended the findings of Buchanan and Tullock; he showed, for example, that industrial interest groups could well prefer systems of marketable emissions permits to effluent standards *if* the permits were distributed free of charge to existing sources.⁷

This general line of analysis thus examined the implications of different policy instruments for the welfare of various interest groups, and in this effort generated a number of insights into just why we would expect to find opposition in certain quarters to efficient and effective policy measures. It is straightforward, for example, to show that a system of pollution taxes (or tradeable permits distributed by an initial auction) is likely to prove more costly to polluting industries than a less efficient assignment of emissions quotas – or even the required adoption of a specified control technology. The point here is that under a system of taxes (or auctioned tradeable permits) polluting firms must bear not only the costs of their pollution control activities, but, in addition, must pay taxes on (or buy permits for) their remaining discharges. And some empirical studies have suggested that even where a command-and-control (CAC) program produces a quite inefficient pattern of abatement efforts, the extra control costs may be dwarfed, in comparison, by the taxes that must be paid under a regime of pollution levies [e.g., Seskin, Anderson and Reid (1983)]. In consequence, it should not be surprising to find that industrial interests have often shown little enthusiasm for the systems of environmental taxes championed by economists.⁸

These first-generation studies of positive theories of environmental policy thus sought to explain how various policy measures affected the different interest groups. But they did not take the next step of actually predicting outcomes. It is one thing to show that policy measure A will be favored by interest group B, but it is much more complicated to show how this measure will be received by the various interest groups (some of which may support it and others not) and then how this will play out in a process of interaction among these groups to produce a policy outcome Hahn (1990).

3.2. *The theory of interest groups and environmental outcomes*

The second generation of work on the positive theory of environmental regulation has taken up this challenging issue. The basic approach involves setting out a public-choice

⁷ For another extension of the Buchanan–Tullock analysis, see Leidy and Hoekman (1996) who treat the issue in the context of an open economy and find further reasons for various interest groups to prefer direct regulation to emissions taxes.

⁸ Opposition from industrial (and other) interests in the early days of environmental legislation also had its source in a failure to understand and appreciate the virtues of a market-based system. In the case of the U.S., for example, Kelman (1981) found that in the late 1970s hardly anyone in the policy-making community could even explain clearly the rationale for incentive-based environmental measures!

or political setting in which competing interest groups, taking the form of lobby groups, provide support in one form or another (often monetary support for their preferred candidate), and then, making use of game-theoretic analytical techniques, characterizing outcomes under differing conditions. Such models can, for example, provide an explicit rationale for the choice of command-and-control instruments over more efficient incentive-based measures under certain specified circumstances.

This body of work draws heavily on recent research into the positive theory of international trade – research that seeks to explain the introduction of tariffs and other impediments to free trade through the political interplay of various interest groups [Hillman (1989), Grossman and Helpman (1994)].⁹ It is useful, following Grossman and Helpman (1994), to distinguish between two strands in this literature. The first envisions the political setting as one of political competition between opposing candidates (or parties). The competing candidates announce the policy measures that they will introduce if elected, and then organized interest groups make their decisions concerning which candidate to support [e.g., Hillman and Upsprung (1992)].

The second approach to the study of endogenous policy determination involves a setting in which an incumbent government seeks to maximize its political support through the choice of policy measures. Under this “political support” type of model, the various interest or lobby groups offer contributions, and the government determines policy so as to maximize the likelihood of being re-elected. This typically involves the maximization of an objective function that includes as arguments both the general welfare of the electorate and the contributions from the various interest groups [e.g., Aidt (1998)]. Under this latter approach involving the so-called “common agency model of politics”, one of the intriguing findings (mentioned earlier) is that if all agents have their interests represented accurately by an interest group, then the political equilibrium is socially efficient. All external effects become effectively internalized through the political process with the result that the policy-maker chooses both the efficient policy instrument and the efficient level of regulation; in the case of environmental policy, this is a Pigouvian tax.

To get a better sense of these quite striking results, it may prove helpful to treat all this a bit more formally. We shall follow Aidt (1998) here; his formulation builds on Grossman and Helpman (1994). In Aidt’s model, the government’s objective function encompasses both social welfare goals and political contributions:

$$G(p, q, t^e) = \Theta W(p, q, t^e) + \sum C^i(p, q, t^e), \quad (1)$$

⁹ The seminal paper by Grossman and Helpman (1994) on tariff policies provides the foundation for much of this work on environmental regulation. The fundamental contribution of this paper is to show that the political support for various policy measures has its source in well-defined preferences of individuals that manifest themselves in a political process that can be described in an explicit, precise manner with a resulting equilibrium policy outcome.

where W is a Benthamite social welfare function, Θ is a weighting parameter, and C^i is the contribution from interest group i .¹⁰ The variables p , q , and t^e represent producer prices, consumer prices, and emissions taxes, respectively. Each citizen is a generalist consumer, a shareholder in one industry (product), and is adversely affected by polluting emissions associated with production.

Aidt limits the government to only two policy instruments: taxes on emissions and product taxes/subsidies. The government can use these instruments both to control emissions and to redistribute income. Each citizen receives an equal lump-sum share of the tax revenue collected.

In the Aidt model, each interest group represents all those citizens that hold shares of a particular industry. However, rather than simply focusing on increasing the profit earned by the industry, the interest group faithfully represents all of its members' interests. Thus, the interest group is concerned with each of the elements affecting its members' welfare. The objective function for each interest group, $W^i(p, q, t^e)$, is thus the sum of its members' utility. Following Grossman and Helpman (1994), it can be shown that the optimal contribution for each interest group is equal to its objective function minus a constant, K^i :

$$C^i(p, q, t^e) = W^i(p, q, t^e) - K^i. \quad (2)$$

With this in place, the insight of concern here, namely the existence of an efficient lobbying outcome, follows in a straightforward manner.¹¹ If all N industries are represented by an interest group (and because each citizen holds shares of only one industry), then all citizens are represented by an interest group. In this case, the government's objective function collapses to:

$$G(p, q, t^e) = (\Theta + 1)W(p, q, t^e) - \sum K^i \quad (3)$$

and the optimal tax levels for the government are the same as those for the social welfare function: product taxes that equal zero and emissions taxes that equal marginal social damage.¹²

¹⁰ We note here that Aidt's model (like many others in this literature) treats government as a single unit by characterizing it in terms of a single, well-defined objective function. This effectively abstracts from some of the richness of a more realistic setting involving both legislative and bureaucratic activities in the public sector and its multilevel structure.

¹¹ Note that Equation (2) implies that in the vicinity of the equilibrium, the lobby group is willing to contribute its full value of the incremental change in the activity. Lobbies thus reveal their true preferences in the neighborhood of the equilibrium. The constant term reflects the division of the rent between the lobby and the government. See Grossman and Helpman (1994) for a careful explication of this point.

¹² Distortions in both the emissions taxes and product taxes/subsidies typically arise when not all industries are represented by a lobby group. In this more realistic setting, Aidt finds another interesting result. If only some interest groups contribute to campaigns, marginal damages continue to enter only the argument for the optimal (from the government's perspective) emissions taxes. For an interesting application of this framework to pollution taxes in an open-economy setting, see Fredriksson (1997).

Deviations from efficient outcomes in this framework result from the failure of lobby groups to emerge to represent certain interests. Aidt does not examine the formation of interest groups. He simply takes their existence as given and assumes that they have overcome the free-rider and associated challenges that confront the organization of these groups. However, the basic theory of public goods leads us, in fact, to expect such failures in organization. In his classic work, Olson (1965) laid out a theory of special interest groups in which he explored the conditions under which effective lobby groups were likely to emerge. As Olson taught us, the basic free-rider problem limits the capacity for individuals with common interests to organize to obtain a collective benefit. Powerful lobbies are typically those that perform some function in addition to providing purely collective goods: they provide direct services to their members or have various tools of “coercion” at their disposal to enforce membership on those who benefit from their activities. So it comes as no surprise to find that certain interest groups – business trade associations, for example, that encompass relatively small and fairly homogeneous groups – are able to organize and represent their collective interests effectively, as compared to larger and more diffuse groups like consumers. Thus, it is easy to see how inefficient policy outcomes can emerge as a result of incomplete representation through interest groups.¹³

In fact, from this perspective what does seem surprising is the extent to which environmental advocacy groups have mobilized their constituencies so effectively. The benefits from programs to improve air quality on a national scale, for example, would appear to represent an Olsonian “large-group” case, where it would be extremely difficult to organize environmental interests. But in seeming contradiction to the prediction of the theory, environmental groups have proved to be a very powerful force in the policy arena. In the case of air quality management in the United States, for example, the efforts of these groups were clearly very important in obtaining at least some standards that appear to be more stringent than the economically efficient ones. Likewise in Europe, a variety of environmental groups have had great influence on measures for environmental protection. In several northern European countries, green interest groups have formed their own political parties and have become part of a governing majority.¹⁴

3.3. *The range and interaction of environmental interest groups*

The issue of interest groups is a complicated one in the context of environmental policy. At the level of pure theory, one can finesse this issue with a very general framework

¹³ Boyer and Laffont (1999) take a somewhat different theoretical approach in which inefficient environmental choices are not the result of incomplete representation. In their framework, inefficient constitutional “constraints” on policy instruments arise from the limitations that these constraints impose on the capacity of politicians to distribute rents.

¹⁴ More generally, Ostrom (1990, 2000) and others have enriched our understanding of organizing behavior, most notably with a wide range of empirical studies that find numerous instances where individuals, in fact, eschew free-rider opportunities and voluntarily band together for purposes of mutual advantage.

that includes n interest (or lobby) groups, each of which contributes money or other efforts to influence policy decisions. In more concrete applications, we find in some simple models cases of two opposing groups: environmental advocacy organizations in opposition to trade associations representing business interests. But the interplay of interests is often much more complex than this; in some instances, the same individuals may find that they wear different hats in that they may be part of several different interest groups. Moreover, there may exist a substantial number of groups with a stake in the choice of policy instruments and their level of stringency: environmental organizations, business interests, labor unions, administrative and trial lawyers, government agencies themselves, as well as the general public. For example, in one applied study of forest-service decision-making, Martin et al. (1996) identified seven separate interest groups who had a stake in oil and gas leasing on federal lands: the oil company seeking the leases, local environmental organizations, the local tourist industry, the local timber industry, local retail/wholesale merchants, local government units, and the federal government (Forest Service). In any particular application (and we shall examine several in the empirical section of our survey), the identification and characterization of the relevant interest groups is an essential and challenging part of the analysis.

The actual choice of regulatory instruments is thus an outcome of a process of interaction between policy-makers and the various interest groups that bring pressure to bear on these decisions. In a recent and intriguing approach to characterizing this process, Keohane, Revesz and Stavins (1998) have suggested that we envision a “political market” in which various interest groups provide a demand for environmental measures and where legislators, offering levels of support for various competing policy instruments, constitute the supply side of the market. In this framework, the legislative outcome (i.e., the choice of policy instrument) is determined by an equilibrium between the aggregated demands of the interest groups and the aggregate political-support supply function of the legislators. The “political currency” in this market encompasses not only monetary contributions but other forms of support for the legislator’s re-election.

While the recent and more formal theoretical work on the political economy of environmental policy is impressive and promising, it would seem to be subject to certain limitations. The formal models typically treat government as a monolithic entity in the sense that they characterize “the” public decision-maker in terms of a single objective function. One might interpret this objective function as somehow representing the collection of public-sector “interests”, but this is not fully satisfactory. As we have noted, the process that generates environmental outcomes is typically a complex and rich one that involves not only legislation, but administrative implementation at the bureaucratic level (often a complicated process in itself), and sometimes judicial review. It is hard to see how strictly formal modelling can ever capture the full range of this complexity. This most assuredly does not imply that these theoretical exercises are without value; we have already noted some of the important insights that they have provided. Rather it should remind us that case studies of particular environmental programs must go beyond the basic theory to consider the course of the regulatory program through the maze of the institutional structure that produces the ultimate outcome.

As a transition to the next section on empirical studies, it will be useful here to summarize in more concrete form some of the important insights that the existing positive theory of environmental regulation has provided into policy choices. As we noted earlier, a primary motivation for this literature has been the observed divergence of actual environmental policy from the efficient measures suggested by economic theory. And this has been done largely by showing that less efficient (so-called “command-and-control”) instruments can, in quite realistic circumstances, be more beneficial to certain important interest groups than more efficient, incentive-based policy measures.¹⁵

1. As we have discussed, certain kinds of command-and-control policies can provide effective barriers-to-entry. It is, in fact, quite possible for such measures to raise the profits of existing firms above those that would exist in the absence of *any* environmental measures.¹⁶ But even where this is not the case, it is likely that relatively inefficient control measures will be less costly to the polluting firm than a system of effluent taxes involving both control costs *and* tax payments (or a system of tradeable permits where firms must purchase permits to validate their residual waste discharges).

2. Environmental organizations may also look unfavorably on certain incentive-based instruments.¹⁷ Many environmentalists object to such instruments on philosophical grounds, espousing the view that pollution taxes or systems of tradeable emission permits (TEP) involve “putting the environment up for sale” and are, for this reason, immoral and unacceptable. Environmental organizations must thus be careful about alienating their members by supporting such policy measures.¹⁸ Moreover, environmental groups may have serious reservations about such policy instruments in practice. If, for example, the environmental authority sets too low a tax rate, then the environmental objective will not be realized. And it may not be an easy matter to raise tax rates where needed.

3. The literature has also clarified some important differences among various incentive-based instruments. In the United States, some environmentalists, for example, have shown much more interest in quantity instruments (systems of tradeable permits) than in price instruments (pollution taxes). They have found that a policy instrument which explicitly limits levels of polluting activities can more reliably achieve environmental goals than a price instrument the response to which is uncertain. And taking this a step further, polluting industries have been more receptive to such quantity instruments *if* the permits are allocated initially free of charge (through some kind of grandfathering

¹⁵ See Keohane, Revesz and Stavins (1998) for an extended treatment of the various ways in which different policy instruments are likely to affect the welfare of the basic interest groups involved in environmental policy-making. Schneider and Volkert (1999) describe why various interest groups are likely to oppose incentive-based policy measures (and environmental policies in general!).

¹⁶ Maloney and McCormick (1982) show the precise conditions under which regulation will increase profits.

¹⁷ See Keohane, Revesz and Stavins (1998) for a good treatment of this.

¹⁸ In the United States, Environmental Defense (formerly the Environmental Defense Fund or EDF) provides an interesting counter-example in which an environmental organization has actively supported a trading system for airborne sulfur emissions and other pollutants as well. Other advocacy groups have begun to follow the lead of Environmental Defense. See [Keohane, Revesz and Stavins (1998, p. 354)].

scheme) rather than auctioned off. In this case, rather than having to purchase permits to validate emissions, the firms receive without cost a valuable asset that can be used either to validate their own emissions or can be sold for a profit. Systems of tradeable permits with a free initial distribution can thus achieve support from various interest groups that may not be forthcoming for other forms of incentive-based instruments.¹⁹

4. Empirical studies of the political economy of environmental protection

There is a wide array of empirical work that explores the actual determination of environmental standards in different places and at different times. It is impossible to characterize this work in any very simple way, but one theme does emerge in nearly all these studies – namely, that actual environmental measures bear the imprint in various ways of the interest groups that have taken part in the debate and design of these measures. Even where, for example, very stringent policies have been adopted in response to environmental concerns, there are typically provisions in the legislation (or subsequent implementing regulations) to accommodate the particular interests of those who must bear the costs. To take one broad case, Ekins and Speck (1999), in their comprehensive survey of the use of environmental taxes in Europe, find that in nearly all the European nations, the implementation of such taxes includes a wide array of significant exemptions and tax relief for particular sectors – often to allay concerns about the adverse effects of the taxes on competitiveness.

The first environmental application of the formal revealed preference approach was that of Magat, Krupnick, and Harrington (1986). They analyzed the technologies that a very diverse set of industries were required to install by the U.S. Environmental Protection Agency to control emissions of two water pollutants: “total suspended solids” (TSS) and “bio-chemical oxygen demand” (BOD). This work was prompted by the observation that in some industries (or sub-categories within an industry), some firms were required to spend a great deal per unit of BOD or TSS removed, while others were asked to spend much less. Among many other things in this comprehensive study, the analyses suggested that the EPA – at least in its standard setting for TSS and BOD – gave very little weight to economic efficiency and appeared not to be influenced by either industry participation in the rule-making process or by the number of plants that might be shut down as a result of the control requirements. What did appear to matter was the strength of the trade association that represented the affected industries and also the profitability of the industries.

As we saw in the preceding section on positive theories of environmental regulation, a number of recent contributions envision an objective function for the policy-maker

¹⁹ However, as recent theoretical work has made clear, the failure of such systems to raise revenues that can be used to reduce other taxes can seriously undermine their efficiency properties. This issue has arisen in the so-called “double-dividend” debate. See, for example, Parry and Oates (2000).

(or legislator) that consists of a weighted average of two kinds of arguments: the contributions of the various interest groups *and* a term reflecting the general social welfare. In this regard, it is interesting to find in several recent empirical studies that measures of social welfare have a significant impact on regulatory outcomes as well as variables indicating the influence of specific interest groups. For example, in an econometric study of pesticide regulation in the United States, Cropper et al. (1992) found that the probability that the U.S. EPA disallowed the continued use of a particular ingredient used in pesticides depended significantly on the estimated benefits and costs of such a restriction; more specifically, both the economic benefits of the ingredient to producers and the degree of health risk it posed were significant determinants of EPA decisions. The explanatory power of the model increased markedly with the addition of some interest group variables (representing business and environmental groups), suggesting that both net social value and interest group pressures mattered in decisions concerning discontinuing the use of particular ingredients.²⁰

On a quite different issue, Hoagland and Farrow (1996) likewise found that the planning decisions made by the U.S. Secretary of the Interior concerning the sale of leases for offshore gas and oil drilling depended not only on political variables, but also on the estimated net social value attached to the various sites. And, in a third case, Hird (1990), in a study of Superfund expenditures to clean up hazardous waste sites in the United States, found that the chief determinant of the pace and funding of cleanup at particular sites was the site's hazard ranking – a measure of its public health risk, with only more modest influence from interested legislators. Such studies thus provide some support for the view that many environmental policy decisions represent a kind of amalgam of group interests *and* general social welfare maximization.

In certain of the theoretical political-support models that we have examined, the formulation is one in which policy decisions depend significantly on financial contributions from interest groups. There is some evidence to support this view in studies of environmental policies. Coates (1996), for example, examined the impact of campaign contributions on the voting behavior of members of the U.S. House of Representatives on a set of amendments to wilderness-designation legislation for federal lands in California and Oregon. Such legislation effectively protects these lands from commercial development so that the issue is essentially one of jobs versus wilderness protection. Coates' estimation of a series of probit equations suggests that campaign contributions had some effect on legislators' positions and voting patterns on the issue. There are some tricky issues of interpretation here, however. As Stratmann (1991) has pointed out, contributions may have the purpose of helping the re-election of a candidate whose position coincides with that of the contributor or they may have the intent of changing the position of a legislator with a view opposing that of the contributor. At any rate,

²⁰ Nadai (1996) provides a more descriptive history of pesticide regulation in the European Union. He finds that various interest groups have been deeply engaged in the evolution of EU policy measures. This is a "case where interest groups have clearly influenced the final content of a regulation" [Nadai (1996, p. 71)]. There is no explicit investigation here of the importance of net social value in the decision process.

Coates finds that contributions had their intended effect, although these effects were not sufficiently large to alter the overall outcome.

Interest groups can also form along regional lines. And there is some evidence to suggest that support for certain environmental measures has, to some extent, reflected the economic self-interest of specific regions. Two studies in the U.S., for example, have found that provisions in the Clean Air Act that were especially costly in rapidly growing areas received disproportionate support from areas that stood to lose economic activity to these areas. Crandall (1983) found evidence in Congressional voting patterns that reflected much stronger support in northern jurisdictions for measures that placed more stringent control requirements on new sources and that limited the growth in pollution in relatively clean areas; such measures resulted in relatively higher control costs in the more rapidly growing southern and western areas in the U.S. Pashigian (1985) likewise found some support for the “locational competition hypothesis”. His analysis suggests (like that of Crandall) that the policy of limiting incremental pollution in clean areas (known as the “prevention of significant deterioration”) derived significant support from those regions that would gain a competitive advantage from the measure.

Finally, we note that our treatment has been wholly in the context of democratic systems where interest groups can express their preferences through various political processes. The setting is obviously quite different in more autocratic systems. Congleton (1992) has, in fact, found that this is an important distinction for purposes of environmental management. He suggests that we should expect more stringent environmental regulations in democratic than in authoritarian regimes, and his findings support this proposition. More specifically, his estimates indicate that democratic countries were much more likely to support stringent limitations on CFC emissions under the Montreal Protocol and actually to reduce emissions of CFC gases. Likewise, Murdoch and Sandler (1997) find that the extent of political and civil freedoms had a positive impact on reductions in CFC emissions in the late 1980s. Political systems clearly influence the extent of environmental protection.

5. Environmental federalism

5.1. The assignment of environmental management to different levels of government

As we have discussed, institutional structure is of central importance in the process of environmental decision-making. One key dimension of this structure is the vertical division of policy-making responsibilities among the different levels of government. This brings us to the issue of the respective roles in theory and in practice of central and decentralized public agencies, both in the design and the implementation of environmental measures.²¹

²¹ For three volumes containing collections of useful papers on environmental policy-making in a federal system, see Braden, Folmer and Ulen (1996), Braden and Proost (1997), and Proost and Braden (1998). They

Here again, there is a body of normative theory from which to derive some basic precepts. Within the field of public economics, the subfield of “fiscal federalism” addresses this set of issues, in particular the distribution of functions among levels of government [for example, see Oates (1999)]. The term “fiscal” here is unduly restrictive; in fact, the so-called principles of fiscal federalism extend to regulatory matters as well. From a normative perspective, the issue here is one of aligning specific responsibilities and regulatory instruments with the different levels of government so as best to achieve our social objectives.

The basic idea that runs through this literature is that the responsibility for providing a particular service should be placed with the smallest jurisdiction whose boundaries encompass the various benefits and costs associated with the provision of the service.²² By structuring decision-making in this way, the levels of public services can be tailored to the specific circumstances – the tastes of residents, the costs of production, and other peculiar local conditions – of each jurisdiction. It is straightforward to show that the pattern of outputs that emerges from allowing efficient decentralized choice in this way increases social benefits relative to a centralized solution that imposes more uniform levels of outputs across all jurisdictions.²³

This “principle” thus establishes a general presumption in favor of decentralized decisions where the benefits and costs are limited primarily to a particular jurisdiction or locality. Moreover, this general prescription has received widespread acceptance. In Europe, the case for decentralization is known as the “principle of subsidiarity”; as such, it is explicitly integrated into the Maastricht Treaty for European Union.²⁴ In the U.S., it is recognized more colloquially as an aversion to the “one size fits all” approach.

From this perspective, we can envision a system of environmental policy-making in which the central government sets standards and oversees measures to address explicitly national pollution problems and intervenes in cases where (like acid rain) polluting activities in one jurisdiction impose substantial damages elsewhere. In addition, the

include both theoretical and empirical studies, several of which compare experiences in the U.S. and Western Europe with multi-level environmental management.

²² In a more realistic sense, it would probably be better to say that responsibility should be placed with the smallest jurisdiction that spatially encompasses the lion's share of the benefits and costs. There are nearly always some small benefits and costs that will escape over jurisdictional boundaries because of people passing through or perhaps even some existence values that accrue elsewhere. If these are large, of course, then a more encompassing presence in environmental decision-making is called for.

²³ For a formal treatment of this proposition (known as the “Decentralization Theorem”) see Oates (1972, Chapter 2, and 1997).

²⁴ The principle of subsidiarity is broadly based and basically states that the responsibility for addressing a particular public issue should rest with the lowest level of government capable of handling the problem. More explicitly, the Maastricht Treaty in 1992 allows action at the Union level “only and insofar as the objectives of the proposed action cannot be sufficiently achieved by the Member States and can, therefore, by reason of the scale or effects of the proposed action, be better achieved by the Community” (E.C. Treaty, Art. 3B). It is interesting that the intellectual source of the principle of subsidiarity is Papal social teaching; Pius XI held it to be morally wrong “. . . to assign to a larger and higher society what can be performed successfully by smaller and lower communities” [(quote taken from Inman and Rubinfeld (1998, p. 545)].

central government would provide basic support for research and the dissemination of information on environmental problems, since these are activities that benefit everyone. At the same time, decentralized levels of government would set their own standards and establish their own programs for managing those dimensions of environmental quality that are primarily contained within their own boundaries (for instance, the standards that a local landfill might have to meet).

5.2. *The issue of a “race to the bottom”*

This basic view of environmental federalism has, however, been the subject of a fundamental challenge, both at the theoretical and policy levels. The source of this challenge is the claim that “local” officials, in their eagerness to encourage new business investment and economic growth, will set excessively lax environmental standards to hold down the costs of pollution control for existing and prospective firms. The result will be a “race to the bottom” with inefficiently high levels of polluting activities.

This turns out to be a quite complicated, as well as contentious, issue. There has emerged a large theoretical literature that explores interjurisdictional competition and its welfare implications.²⁵ It has two sides. It is not difficult, on the one hand, to describe a world in which competition among governments for new business investment is welfare-enhancing, where it leads to Pareto-efficient choices involving, among other things, levels of local environmental quality. Oates and Schwab (1988, 1991, 1996) have constructed a series of such models in which local jurisdictions compete for mobile firms both to increase levels of wage income and to enlarge the local tax base. These models generate a set of “invisible-hand” outcomes in which such competition induces local decision-makers to select efficient levels of local outputs (including environmental quality).

These models are, however, quite demanding in terms of some essential conditions: governments are small in the sense of being price takers in a large capital market and not engaging in strategic behavior in response to the policy choices of other competing governments; they have access to the full range of policy instruments they need for efficient fiscal and regulatory decisions; and public outputs are wholly self-contained – they have no external effects on other jurisdictions. Within such a setting, it is not difficult to construct a quite rich model in which governments compete with one another for mobile firms making use of expenditure, tax, and environmental policy instruments, and where the outcome for all these policy measures is Pareto-efficient. Competition in such a framework is efficiency-enhancing; in a kind of analogue to the case of perfect competition in the private sector, it guides public decisions into efficient outcomes.

On the other hand, if any of these conditions are relaxed (often in quite realistic ways), the efficiency properties of these models of interjurisdictional competition can be

²⁵ Wilson (1996, 1999) provides two excellent surveys and assessments of this literature. The former paper (1996) focuses explicitly on the race-to-the-bottom issue in environmental management. In a recent book, Wellisch (2000) presents a thorough and rigorous review of the fiscal competition literature.

compromised. Governments may not, for example, have access to the tax and regulatory instruments they need for efficient public management. An important line of work in the fiscal competition literature examines the case where “local” governments can tax only mobile capital so that all public services must be financed by a tax on local firms [Zodrow and Mieszkowski (1986), Wilson (1986), Wildasin (1989)]. In this setting, a kind of fiscal externality arises in that local officials do not take into account the impact that their policy decisions have on tax bases in other jurisdictions. The typical outcome in such models is one in which public services are underprovided. Distortions can also occur where governments are large in the sense of having an impact on the price of capital – or where they behave in strategic ways in the setting of policy parameters.

Of direct relevance here is a public-choice setting in which public agencies have their own set of objectives, including such things as budget maximization. If local officials seek to enlarge the size of the public sector, it is straightforward to show that they will tend to set overly lax environmental measures in order to attract more capital and enlarge the local tax base [Oates and Schwab (1988)]. More generally, there exists a large and rich literature, much of it drawing on game-theoretic models, that explores these issues and describes the sorts of allocative distortions that competition can generate in a variety of settings [Wellisch (2000)].

The theory of environmental federalism thus leaves us in an uneasy position. While there are clearly ways in which economic competition among governments can encourage good fiscal and environmental decisions, there are also circumstances where things can go awry. And the important issue here is really one of magnitude: how large are the kinds of distortions that this literature describes? If they represent only small deviations from efficient outcomes, they may not be of much consequence. The problem is that we have little evidence on this. There is plenty of evidence that governments actively engage in various forms of economic competition. But this really does not address the issue. Such competition *may*, as we have discussed, be healthy in the sense of encouraging good public decisions. Thus, the discovery that governments introduce policy measures to influence industrial location really does not tell us much about any distortions that may be present or their magnitude [Courant (1994)].

5.3. Environmental federalism in practice: Some evidence

When we look at the actual practice of environmental decision-making, we find that it has often tended to be quite centralized. In the United States, for example, the Clean Air Act Amendments of 1970, one of the cornerstones of federal legislation emerging from the environmental movement of the 1960s, directs the central government [more precisely, the Environmental Protection Agency (EPA)] to set uniform standards for air quality – standards that must be met (or exceeded) in every part of the country. Moreover, these standards (in the form of maximum allowable pollutant concentrations) are to be set so as to protect the health of the most sensitive residents with little regard to their cost or other mitigating circumstances. In addition, Congress itself established tailpipe emissions standards that were to apply uniformly to all new vehicles sold in

the U.S. (with the exception of California, which was granted the right to set more stringent standards). In contrast, it is interesting that two years later, the U.S. Congress introduced sweeping measures for water quality management that call for the states to set their own standards for water quality. But, at the same time, Congress directed the EPA to issue technology-based discharge standards for all publicly-owned sewage-treatment plants and for virtually all industrial sources of water pollution. There is thus a real ambivalence that runs through U.S. environmental federalism.

Likewise, the emerging European Union is struggling with the extent to which environmental measures should be harmonized across Europe and the extent to which such decisions should remain with the member states [Leveque (1996), Pfander (1996)]. As we mentioned, there is a general recognition of the principle of subsidiarity, but various types of arguments have convinced many that Union-wide standards are needed to address a range of environmental problems. In particular, there has been support in Europe for harmonization for purposes of encouraging the development of a common market. This makes some sense for the case of product standards. Without such standards, one member state may exclude products of others if they do not meet its own health, safety, and environmental standards. From this perspective, a harmonized set of standards can facilitate the free movement of goods and services within Europe. This case is, however, much less compelling for so-called process standards that relate to the conditions under which products are manufactured. The need for setting uniform standards for ambient environmental quality or uniform emissions standards at the European Union level is much less clear. In fact, proponents of such measures in Europe, like their counterparts on the other side of the Atlantic, have relied heavily on "race-to-the-bottom" arguments.

The Council of the European Union has extensive powers for environmental governance. It is authorized to issue "directives" to the member states on environmental matters, and, according to Article 189 of the Maastricht Treaty, such directives "shall be binding, as to the result to be achieved, upon each Member State to which it is addressed, but shall leave to the national authorities the choice of form and methods". The Treaty thus gives the Union the power to command the member states to meet centrally defined standards for environmental quality.²⁶ However, the Council's decisions still require *de facto* unanimity so that its powers are, in fact, quite circumscribed.²⁷ Moreover, there is evidence that the member states have not always complied with these directives; the problem of enforcement remains a basic concern.

In terms of existing policy, there seems to be a good deal of confusion on both sides of the Atlantic. The degree of decentralization of environmental management differs significantly for various pollutants, often with little justification in terms of any apparent principles. Moreover, in Europe, attempts to centralize standard-setting have been frequently undercut by the reluctance of member states to comply with the directives.

²⁶ This structure bears some similarity to the Clean Air Act in the United States, where the EPA sets the air-quality standards to be attained, and the states are then directed to develop plans to reach these standards. For an excellent comparison of environmental federalism in Europe and the United States, see Pfander (1996).

²⁷ Braden and Proost (1996) describe and assess this issue in the context of a comparison of policies in Europe and in the U.S. for controlling tropospheric ozone.

Environmental federalism thus remains a highly contentious issue, both in terms of theory and practice. The case for centralization relies heavily on the adverse effects of competition with a resulting race to the bottom. But does such a “race” really exist? The support for an affirmative answer to this question is largely anecdotal; to our knowledge, there is little systematic evidence in its support.

On the other side, there is some, if admittedly limited, evidence suggesting that there is no widespread race to the bottom. If there were fierce and distorting economic competition, we might expect to find few instances in which decentralized jurisdictions introduce environmental measures that are more stringent than the centrally determined standards. Yet in the United States at least, we find plenty of instances where states have introduced regulations for the control, for example, of pesticides and hazardous wastes that go well beyond federal requirements. The one instance where the states have not gone beyond federal standards relates to the ambient air quality standards under the Clean Air Act. But our sense of this case is that the legislation calls for such stringent measures (standards so tough that there are no adverse health effects from air pollution *irrespective* of the costs of control) that few would want anything tougher.²⁸

Using another approach, three recent studies in the U.S. have examined the impact on environmental outcomes of the devolution of responsibilities during the Reagan years for certain aspects of environmental management. Although this covers an admittedly short time span, it is interesting that none of the three studies finds any evidence of a race to the bottom. List and Gerking (2000), using state-level data, have estimated a fixed-effects model that looks at both levels of environmental quality and abatement expenditures. They find no evidence of any deterioration in environmental quality or decline in abatement efforts; on the contrary, they find some instances of improvements leading them to conclude that “. . . in this instance, the race to the bottom did not appear to materialize”. In another assessment of the experience in the Reagan era, Millimet (2000) has studied airborne emissions of sulfur dioxide and industry spending on pollution abatement. He finds that actual emissions were lower and abatement spending higher than forecast by his model, suggesting a race to the top rather than the reverse. Finally, Fredriksson and Millimet (2002) likewise find little impact of Reagan devolution on environmental policy; their results, in fact, provide evidence for a strategic race to the top among U.S. states.²⁹

²⁸ In this context, Goklany (1999) provides a provocative account of the history of air quality management in the U.S. in which he documents the sometimes quite extensive and effective measures introduced by state and local governments prior to federal intervention with the Clean Air Act Amendments of 1970.

²⁹ In another piece that extends the Grossman and Helpman (1994) model of competing interest groups, Fredriksson and Gaston (2000) find that, in a model where capital is perfectly mobile across domestic jurisdictions but immobile internationally, centralized and decentralized environmental management yield identical environmental regulations. In their model, the stringency of environmental measures is independent of institutional structure. This interesting result emerges from an internalization of the social costs of emissions through differing efforts (i.e., campaign contributions) of capital owners, environmentalists, and labor under the two regimes. The authors suggest that EU recycling policies support this result in that the centralization of these measures neither increased nor decreased their stringency, but represented a rough average of the policies in member countries [Paul (1994/95)].

The efficiency gains from environmental measures that are tailored to local circumstances may be quite substantial. In one study, Dinan, Cropper and Portney (1999) have examined the case of drinking water standards in the United States. This is an interesting case for two reasons. First, the purity of local drinking water (with the exception of a couple of contaminants) is mainly of interest to local users; any adverse effects manifest themselves only after prolonged exposure. We can thus reasonably characterize this as a local public good. Second, there exist large economies of scale in the treatment of drinking water such that the costs of additional purification per household can be much higher in smaller, than in larger, jurisdictions. The Safe Water Drinking Act of 1974 instructed the U.S. EPA to set national standards for drinking water. But as the authors find, a set of uniform national standards can be quite inefficient. They examine the case of a particular class of contaminants, a class of radionuclides known as “adjusted gross alpha emitters”. And they find that the quite stringent EPA standard can be justified on benefit–cost grounds for only the very largest districts where the costs can be shared among several hundred thousand households. For smaller districts, the standard has (often quite large) negative benefits.

There remains, in our view, a strong case for “localized” environmental management where the benefits and costs of such measures are themselves localized. The potential efficiency gains may be large; moreover, there is little evidence of a destructive “race-to-the-bottom” in environmental regulation.³⁰ At the same time, we stress that there remains a crucial role for central government. In addition to addressing “national” pollution problems (where emissions spillover across jurisdictional boundaries), a central environmental agency can provide essential information and research support. We can envision a system of environmental management in which a very active central agency not only supports research into environmental issues, but offers guidance to “local” authorities in the form of recommended standards and levels of treatment that effectively lay out the menu of choices available to local decision-makers. In such a setting, local agencies could then select the parameters for environmental programs that best suit their local constituencies.

6. Concluding observations on some recent trends

In concluding our survey of the political economy of environmental policy, we want to call attention to the quite striking and fascinating evolution of environmental management over the past few decades – and, in particular, to the role that economics plays in the design of new policy measures. In the early days of the environmental movement in the 1960s and early 1970s, there existed a strong disposition toward command-and-control approaches to regulation. Under these approaches, environmental agencies set standards with little regard to their economic implications and then issued directives

³⁰ For an excellent review and critical assessment of this issue, see Revesz (2001).

to polluters limiting their levels of waste emissions and often specifying the control technology. The economic prescriptions for the setting of standards by balancing benefits and costs at the margin and for the use of incentive-based policy instruments to achieve these standards were largely ignored on both sides of the Atlantic. But things have changed in some quite dramatic ways.

First, new procedures have been introduced requiring the systematic measurement and sometimes consideration of the benefits and costs associated with policy measures. Pearce (1998) provides a careful description of the evolution of environmental appraisal procedures in the European Union. The Fifth Environmental Action Plan, promulgated in 1992 by the European Community calls explicitly for "... the development of meaningful cost/benefit analysis methodologies and guidelines in respect of policy measures and actions which impinge on the environment and natural resource stock" [Pearce (1998, p. 490)]. Pearce finds that "Since the early 1990s formal appraisal procedures have improved and are applied more widely" [Pearce (1998, p. 498)].

Likewise, in the United States, various Presidential Executive Orders have called for benefit–cost analyses of all major environmental regulations.³¹ The most widely publicized of these was Reagan's Executive Order 12291 in 1981 which required not only that benefit–cost studies be carried out for all major regulatory programs but that, to the extent permitted by law, regulations be undertaken only if the benefits exceed the costs. The U.S. EPA has been making benefit–cost studies of environmental regulations since the mid-1970s, but has been limited in applying them to actual decisions by various statutes. We can do no more than note that in key parts of various environmental laws in the U.S., regulators are prohibited from even considering costs in setting ambient standards, while under other statutes, they are almost required to strike a balance between benefits and costs in standard setting. There is little consistency here. As Morgenstern (1997) puts it, "Various statutes forbid, inhibit, tolerate, allow, invite, or require the use of economic analysis in environmental decisionmaking" [Morgenstern (1997, p. 20)].

Second, there has been increased interest in, and some use of, incentive-based policy instruments for the attainment of environmental standards.³² The economic prescriptions for policy measures that were essentially ignored in the early days of environmental legislation are getting a much wider hearing in the current policy arena and are actually appearing in practice. The use of taxes to discourage polluting activities and the introduction of systems of tradeable emissions allowances are now more than just ideas appearing in textbooks on the subject.

What accounts for these modifications in the direction of environmental policy? This is not an easy question to answer.³³ To some extent, the deficiencies associated with

³¹ Hahn (1998) provides a concise and insightful history and assessment of the U.S. experience with benefit–cost analyses of environmental and other forms of regulation in the U.S.

³² For an excellent treatment of this issue, see Chapter 9 (by Stavins). Hahn (1989) provides an insightful history of the early efforts in the U.S. and Europe to introduce incentive-based policy instruments for environmental protection.

³³ Oates (2000) tries to answer this question in the context of the United States. It is clear in retrospect that some serendipitous events helped set the process in motion.

command-and-control techniques have become more apparent over time, and the resulting dissatisfaction has stimulated the search for alternatives. In this context, the growing number of economists who have turned their attention to environmental issues have played an important role both in educating policy-makers and in taking a more active role in the design and implementation of feasible policy measures. As we move farther down the path of environmental protection, we are finding that yet tighter controls on polluting activities are becoming increasingly expensive. And this puts a higher premium on finding efficient means for regulating them. But more generally, the last two decades have been a period of renewed “faith in market forces” [Kay (1988)] in which perceived “government failures” have ushered in a setting in the Western world that is much more receptive to market-based forms of regulation.

An intriguing anomaly in this process of evolution is the rather different paths taken on the two sides of the Atlantic. In Europe, the tendency has been to turn to environmental taxes to provide incentives for reducing pollution.³⁴ In contrast, regulators in the United States have adopted systems of tradeable emissions allowances to control airborne emissions of sulfur dioxide, as well as some other air pollutants and other forms of damaging emissions.³⁵ The reasons for this divergence in the choice of policy instruments is not altogether clear. But it does seem to represent to some extent the rather extreme aversion to new forms of taxation in the United States and perhaps some historical accidents as well [Hahn (1989), Oates (2000)].³⁶

At any rate, the atmosphere for environmental regulation has changed quite dramatically. There is now attention given to incentive-based policy measures in many countries around the world. Indeed, there is even serious consideration being given to systems of tradeable allowances on a global scale to address the problem of climate change [Hahn and Stavins (1995)]. The various interest groups have found that there are ways in which incentive-based policy instruments can be constructed and implemented that make them suitable for their support (especially when their cost-minimizing properties can be used to fight for a more stringent standard than would be politically possible

³⁴ For useful treatments of the European experience with environmental taxes, see Brannlund and Gren (1999) on the Scandinavian countries, Smith (1995) on Britain and Germany, and Dijkstra (1999) on the Netherlands. The papers in Bluffstone and Larson (1997) provide an extensive description and analysis of the use of taxes and charges for pollution in the transition economies of Eastern Europe.

³⁵ Tietenberg (1985) provides a careful description and assessment of the U.S. Emissions Trading Program, a program that evolved in interesting ways to facilitate the trading of emissions allowances within air quality control regions. More recently, Ellerman et al. (2000) have described and analyzed the U.S. experience with sulfur allowance trading on a national scale to address the acid-rain problem. A smoothly functioning and efficient market has developed for the trading of sulfur allowances.

³⁶ There are some exceptions. The U.S. did introduce at the federal level a tax on CFC's; in addition, there is some use at state and local levels of unit charges on municipal solid waste and peak-period tolls on some freeways. Wallart (1999, p. 104) suggests interestingly that this difference in approaches may be in part a cultural phenomenon. He notes the impact in America of the Coasian perspective which suggests that distortions from externalities result from the non-existence of markets. In contrast, in Europe, the Pigouvian tradition is the predominant one with its focus of the malfunctioning of markets in the presence of externalities and the need for corrective taxes.

under a command-and-control approach). In addition, as we saw in several empirical studies, the relevant benefits and costs of environmental measures are by no means without their influence on policy decisions; with the accumulating experience with environmental programs, there seems to be a discernible trend toward more efficient decision-making for environmental protection.

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