5. The positive political economy of instrument choice in environmental policy

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1 INTRODUCTION

The design of environmental policy requires that two central questions be addressed: (1) what is the desired level of environmental protection? and (2) what policy instruments should be used to achieve this level of protection? With respect to the second question, thirty years of positive political reality in the United States have diverged strikingly from the recommendations of normative economic theory. Our purpose in this paper is to explain why.

Four gaps between normative theory and positive reality merit particular attention. First, despite the well-known economic advantages of market-based instruments, command-and-control standards have been used much more frequently by US Congress, Office of Technology Assessment, 1995. Second, when command-and-control standards have been used, the required level of pollution abatement has generally been far more stringent for new sources than for existing sources. This dual system may actually worsen poverty by encouraging firms to keep older, dirtier plants in operation (Stewart, 1981). Third, in the relatively rare instances in which market-based instruments have been adopted, they have nearly always taken the form of tradable permits rather than emission taxes, although economic theory suggests that the optimal choice between the two is dependent upon case-specific factors. Moreover, the initial allocation of such permits has been through ‘grandfathering,’ or free initial distribution based on existing levels of pollution, rather than through auctions, despite the economic superiority of the latter mechanism. There are four alternative market-based instruments available: taxes, revenue-neutral taxes, auctioned permits, and grandfathered permits. Despite the numerous trade-offs that exist in normative economic terms, the US experience has been dominated by one choice – grandfathered permits. A fourth, conceptually different, gap, between...
prior and current political practice, is also worthy of attention: in recent years, the political process has been more receptive to market-based instruments, even though they continue to be a small part of the overall portfolio of existing environmental laws and regulations. After being largely ignored for so long, why have incentive-based instruments begun to gain acceptance in recent years?

Commentators have advanced various explanations for the existence of these gaps between normative theory and positive reality. Some explanations emerge from formal theories. Others take the form of informal hypotheses: they purport to explain certain aspects of environmental policy, but are not part of a formal theory of political behavior. In this paper, we review, evaluate, and extend these explanations. Moreover, we place these disparate explanations within the framework of an equilibrium model of instrument choice in environmental policy, based upon the metaphor of a political market.

The scope of the paper is intentionally limited. Our emphasis is on the control of pollution rather than the management of natural resources. We treat Congress, rather than administrative agencies, as the locus of instrument choice decisions and we view legislators (rather than regulators) as the 'suppliers' of regulation. Moreover, we focus exclusively on the choice among the instruments, such as tradable permits, taxes, and standards, used to achieve a given level of environmental protection. We do not explore the related issues of how the level of protection is chosen or enforced. Nor do we address the issue of why Congress chooses to delegate authority to administrative agencies in the first place (Florina, 1982). Finally, our outlook is positivistic, not normative: we seek to understand why we have the set of tools we do, rather than which tools are desirable.

The next section presents the key features of our market framework. In Part 3, we consider the demand for environmental policy instruments, and in Part 4, we examine the supply side. Part 5 offers concluding remarks.

2 A MARKET FRAMEWORK FOR EXAMINING INSTRUMENT CHOICE

The metaphor of the 'political market' is a fairly common one, especially among economists and public choice theorists interested in the politics of regulation. Some theorists have contemplated the market for votes within a legislature – with legislators acting both as demanders and as suppliers of votes. Others have modeled politicians as brokers in a market between those who 'demand' benefits (firms and special interests) and those who 'supply' them (taxpayers). Finally, perhaps the most common approach (and the one we take in this paper) focuses on the exchange between legislators and constituents or interest groups.

We use the market metaphor to provide a framework for synthesizing various theories of instrument choice. In our simplified model of the legislature as a political market, interest groups (the 'demanders') provide 'currency' in the form of political resources in return for legislators' support for a given instrument in a specific policy context. A schematic view of this political market is provided in Figure 5.1. For each instrument, a competitive equilibrium is determined by the interaction of the aggregate supply of political support and the aggregate demand for such support. This equilibrium determines the aggregate support in the legislature for a particular instrument. The legislative outcome – the choice of a policy instrument – then depends upon the relative degrees of support generated for alternative policy instruments.

In the following sections we describe the political market's commodity and currency, and then discuss the origins of regulatory demand and supply, respectively. Finally, in this part, we discuss the nature of political market equilibria and the legislative outcomes that result.

2.1 The Political Market's Commodity and Currency

We view each legislator as supplying some degree of support for a given regulatory instrument. Interest groups seek to secure support from legislators in the political market. Importantly, we take this commodity to be homogeneous among legislators. That is, the support produced by one legislator is equivalent to (a perfect substitute for) support produced by any other legislator. Hence, we think of this commodity as 'effective support.' It is a measure of input (output), not of effort (input).

To be sure, different legislators require differing amounts of effort to produce a unit of effective support. These variations in productivity are due to such factors as the size and effectiveness of members' staffs, their seniority, their committee assignments, and their leadership positions, including committee chairmanships. Moreover, a legislator's effort (the 'input') into the production of support may encompass a much larger range of activities than simply voting for a given instrument: among other things, a legislator might hold hearings, attend committee markups, draft or sponsor legislation, insert statements into committee reports, propose amendments, seek to influence colleagues, or make behind-the-scenes deals.

We take the political currency in this market to be resources for the legislator's re-election: not only votes, but also monetary and other contributions. An environmental interest group, for example, may publicly endorse a candidate for office, or may volunteer time and effort to mobilize votes in a legislator's district. Other forms of 'payment' (assistance) to legislators, such as time spent drafting legislation or policy information provided to the legislator, are also valued
Environmental economic:

- Ideological costs
- Electoral costs
- Opportunity cost of time

Other legislators' supply functions

Legislators' supply functions

Aggregate legislature supply

Legislature's equilibrium level of support for a given instrument

Comparison of support across instruments

Policy instrument choice

Aggregate demand (diminished by free-riding among groups)

Demands of other interest groups

Individual interest group demand

Interest group member preferences

Impact on organizational well-being

Figure 5.1 An equilibrium framework for examining the political market

Instrument choice in environmental policy

by a lobbyist seeking re-election, since association with the interest group may increase the lobbyist's support, and the time saved by the lobbyist may be spent on activities that generate home district votes. We incorporate home district votes, financial contributions, and nonmonetary contributions in the currency of 'resources,' and we adopt a monetary numeraire simply for purposes of convenience.

2.2 Origins of Demand for Environmental Policy Instruments

Demand for the support of legislators comes from diverse interest groups, including environmental advocacy organizations, private firms, and trade associations. Each demander has its own demand function: a decreasing marginal willingness-to-pay for a lobbyist's policy support. For individuals in particular (as well as for firms), political demands are expressed by interest groups, raising the possibility of free-riding.

2.2.1 Firms and Individuals

Firms are affected by environmental regulation through the costs they incur in producing goods and services. Consider a price-taking firm wishing to maximize its profit from producing a single product that employs a set of factors in its production, each of which has some cost associated with it. One of these factors or inputs is the set of relevant features of the regulatory environment. In seeking to maximize profits, the firm chooses levels of all of its inputs, including the efforts it puts into securing its desired regulatory environment. In the simplest model, firms have a decreasing marginal willingness to pay to secure particular policy instruments, producing a downward-sloping factor demand curve for legislative support.13

The choice of environmental policy instruments can also have an effect on individuals. For example, individuals can be affected by the level of environmental quality that results from the use of a particular instrument,14 or by the costs of environmental protection that are reflected in the prices of the goods and services they buy. Individuals might even derive some direct utility from knowing that a particular type of policy instrument was employed. It seems reasonable to assume that individuals will respond to an increase in the 'price of legislative support' relative to other goods by reducing their demand for legislators' services, yielding a downward-sloping demand function for legislative support.15

Individuals can be thought of as having attributes of 'consumers,' 'environmentalists,' and 'workers.' These three categories are neither mutually exclusive nor exhaustive. We think of individuals as 'consumers' to the degree that the choice of environmental policy instrument affects them through its impact on
the prices of goods and services; as 'environmentalists' to the degree that they are affected by the impact of instrument choice on the level of environmental quality; and as 'workers' to the degree that they are affected by environmental policy through its impact on the demand for labor, and hence their wages.

2.2.2 Interest groups

Because there are significant costs of lobbying and because the target of demand—the public policy—is a public good, an individual and even a firm will receive relatively small rewards for any direct lobbying efforts. For individuals, the marginal costs of lobbying are likely to outweigh the perceived marginal benefits over much of the relevant range of lobbying activity, and individuals will underrun lobbying, hoping instead to free ride on the efforts of others. Although some large firms maintain offices in Washington, DC, to facilitate direct lobbying of the Congress, most of the demand for public policies from both firms and individuals is transmitted through organized interest groups.

The free-riding problem that stands in the way of individual lobbying efforts can also be a significant obstacle to the formation of interest groups (Olson, 1965). For an interest group to organize, it must find a way to overcome the free-riding problem: it must offer its members enough benefits to make the costs of membership worthwhile. For a citizen group such as an environmental advocacy organization, these benefits are likely to include: 'material incentives,' such as newsletters, workshops, or gifts; 'solidary incentives,' essentially the benefits derived from social interaction; and 'purposive incentives,' the personal satisfaction derived from membership in an organization whose activities one supports (Rothberg, 1992; Wilson, 1973). Among citizen groups, taxpayer and consumer organizations may face greater free-riding problems than environmental groups: it is likely that environmental groups have more material incentives (calendars, stickers, outdoor trips, and so forth) and more compelling purposive incentives (the moral mission of 'saving the planet') to attract potential members.

In order to overcome their own set of free-riding problems, trade associations can offer a range of benefits to their members that non-members do not enjoy, including: influence over policy goals; information on policy developments; reports on economic trends; and participation in an annual convention (Olson, 1965). Compared with citizen groups, trade associations may have significant advantages in overcoming free-riding: they are usually smaller, making the contributions of each member more significant; and even substantial annual dues may be negligible costs for member firms (Wilson, 1973). Hence, we might expect that private industry interests will be over-represented in the political process compared with citizen groups.

Once organized, an interest group may not simply aggregate the political demands of its members. Rather, the interest group (or more precisely, its staff) has its own self-interests, which may diverge from the goals of its members. If members are unable to observe the output or effort of the interest group staff, a principal-agent problem may arise between the members (the principals) and the staff (their agents). The result can be 'slack' between what members want and what the organization actually does. A trade association, for example, may not only want to maximize the profits of its member firms; it may also seek to expand its membership or to increase revenue from member dues. Similarly, the objective function of an environmental group may include not only the level of environmental quality, but also factors such as membership size, budget, and reputation among various constituencies which affect the organization's health and viability.

In seeking to secure as much support as possible in the legislature for its preferred outcome, an interest group must decide how to allocate its scarce resources. The total benefits to an interest group of the legislature's support for an instrument rise with the degree of support offered, but there are decreasing marginal returns. As in the case of individuals and firms, a unit increase in support when the legislature is already very favorably disposed to one's position is worth less than a unit increase in support by a lukewarm or previously unsupportive legislature. This characteristic produces a downward-sloping demand function: an interest group's marginal willingness-to-pay for support decreases as the legislature's total support increases.

2.3 Origins of Supply of Environmental Policy Instruments

We consider a case of a legislator who derives utility from a constellation of factors made possible by being a legislator: making public policy, doing good things for the country or for her district, satisfying ideological beliefs, having prestige and the perquisites of office, and so on. To continue getting utility from these factors, the legislator must be re-elected. We assume that legislators seek to maximize their expected utility. In choosing a policy position (level of support for a proposed instrument), therefore, the legislator takes into account the effort required to provide that support, the inherent satisfaction she derives from providing that level of support, and the effects her position will be likely to have on her chances of re-election.

Thus, our framework allows for the legislator's supply function to consist of three components: (1) the opportunity cost of time (effort) required to provide a given degree of support for a policy instrument; (2) the psychological cost of supporting an instrument despite one's ideological beliefs (if supporting the instrument is consistent with one's ideological beliefs, then this is a 'negative cost,' that is, a benefit); and (3) the opportunity cost (in terms of reduced probability of re-election) of supporting an instrument not favored by one's
Electoral constituency (this is also a 'negative cost' if supporting the instrument is consistent with one's constituencies' positions).

The first component emerges from the individual legislator's productivity in providing 'effective support.' Some legislators are more efficient producers of effective support from a given amount of effort than others for a host of reasons, including the size and effectiveness of their staffs, their seniority in the legislature, and, importantly, their membership and leadership on relevant committees. If each legislator experiences decreasing marginal returns to effort in the production of effective support, the generic 'support production function' will be concave. By placing a value on the opportunity cost of time and effort, we derive a convex opportunity cost function. In turn, such a cost function implies an upward sloping marginal opportunity cost of effort, as shown in Figure 5.2.\(^6\)

![Diagram of Legislator's Supply Function]

**Figure 5.2 Opportunity costs and the supply of political support by an individual legislator.**

Next, we posit that a legislator derives disability from acting inconsistently with her ideology. Thus, we introduce the psychological cost of supporting a policy that is inconsistent with one's ideological beliefs. As suggested above, this cost would be negative (a benefit) if one were ideologically predisposed to favor the particular policy. In either case, it is conceivable that these marginal (psychological) costs might be increasing or decreasing (in absolute value) with the degree of support, but for ease of presentation we portray this marginal cost as constant in Figure 5.2. In this case, the legislator's ideology has no effect on the slope of the combined marginal cost function; rather, ideology shifts the function upwards (for inconsistency with ideology) or downwards (for consistency with ideology).

The final component of the legislator's supply function is the marginal 'electoral cost' of support. To the extent that a legislator offers support to an instrument not favored by her electoral constituency, her re-election becomes less likely, forcing the legislator to expend more resources to achieve a given probability of re-election. This effect can be either direct in the form of lost votes from constituents unhappy with the legislator's position, or indirect as a result of the opposition of interest groups unhappy with the legislator's position, which through protest and grassroots mobilization could affect the constituents' assessment of the legislator.\(^7\) Again, this effect is a 'negative cost' if supporting the instrument is consistent with one's constituencies' positions. As with ideological costs, these marginal electoral opportunity costs could be increasing or decreasing with the level of the legislator's support, but to keep things simple we draw them as constant (and positive) in Figure 5.2.\(^8\)

The overall (individual) marginal cost function – the legislator's supply-of-support function – is simply the vertical summation of these three components: opportunity costs of effort, ideological costs, and constituency costs (Figure 5.2).

The amount of support for a policy instrument that a legislator would supply at zero price, that is, in the absence of any contributions helpful to advancing the member's goals, including her re-election, is represented in Figure 5.3 as the 'preferred point,' the intersection of the supply function with the horizontal axis. In this framework, the legislator can be induced to offer greater degrees of support than this preferred point by offers of 'political compensation' which offset the legislator's opportunity costs arising from such support.

Thus, the legislator has an upward-sloping marginal opportunity-cost or supply function, beginning at her preferred degree of support along the horizontal axis. The intersection of the supply function with the horizontal axis can take place at either a positive or a negative degree of support (see \(S_1\) and \(S_2\), respectively, in Figure 5.3). A politician who is strongly opposed to a given instrument because of a combination of her own ideology and her constituencies' preferences will have a supply function with a negative intercept on the horizontal axis (and a positive intercept on the vertical axis). For such a legislator, a positive, non-
marginal shadow price of political compensation is required for any positive degree of support to be forthcoming (see point A in Figure 5.3).

Figure 5.3 Supplies of political support by individual legislators

A legislator's supply function is affected by several exogenous factors. First, an exogenous increase in the negative impact of a given instrument on a legislator's constituents (for example, the construction of a new factory which would have to pay pollution taxes) would increase the legislator's opportunity costs of supporting that instrument. Conversely, an exogenous increase in the benefits of an instrument to the legislator's constituents (for example, the expansion of a firm in the district which produced a mandated abatement technology) would decrease the legislator's opportunity costs. Second, the position of the legislator's political party is also relevant. Parties supply funds and organizational support in re-election campaigns. Moreover, leadership posts in the party offer opportunities for increased effectiveness in the legislature. Obviously, parties are likely to be more generous with legislators who are loyal. Third, the actions of other legislators will have a bearing on the costs of supplying support because of the possibilities for vote trading. For example, one legislator may care a great deal about the level of environmental protection chosen, while having only a slight preference for standards over taxes; another legislator may care less about the exact level but have a strong preference for taxes over standards, perhaps because of her own market-oriented ideology. In a logroll, both legislators could gain from vote trading, and such a logroll would affect both legislators' costs of supplying support for a given instrument. Fourth and finally, it is both the intent and the consequence of some lobbying activities to shift legislators' supply functions. In other words, in addition to being the primary demanders for alternative forms of regulation, organized interest groups can also play a role in determining the position and shape of legislators' supply functions. Lobbyists might attempt to: affect a legislator's ideologically-based perception of the merits of a proposed policy instrument (Kingdon, 1989); affect a legislator's perception of her constituents' policy preferences (Austen-Smith and Wright, 1994); and/or affect a legislator's effort-support production function through, for example, provision of information or technical support (Bauer, Pool, and Dexter, 1963).

2.4 Formation of Equilibria and Legislative Outcomes

Up to this point, we have focused on the origins of supply and demand for a single policy instrument. In many contexts, there will be a set of possible instruments considered for achieving a given policy goal; for example, a standard, tax, and a system of tradable permits. In addition, there will exist the possibility of doing nothing, that is, maintaining the status quo. Hence if N alternative instruments are under consideration, then there will be N + 1 possible choices of action. We view each option as defining a 'political market' for effective support. On the demand side, each policy instrument may have an associated set of interest groups seeking to secure support for it. On the supply side, each policy instrument gives rise to its own set of legislator supply functions. A single legislator may be more efficient at producing support for one instrument than for another; she may have differing ideological attitudes towards different instruments; and the preferences of her re-election constituency may vary across instruments as well.

The legislative outcome is the choice of one of the N + 1 alternatives arising from the interactions of interest groups' demands for and legislators' supplies of support for alternative instruments. The degree of aggregate support for each instrument results from an equilibrium established in the legislature, and the outcome in the legislature favors the policy instrument with the greatest degree of total support.

In the following sections, we examine the component parts of this process. We first consider the nature of the aggregation of demand for a policy instrument
across interest groups, and the aggregation of supplies of support for a policy instrument across members of the legislature. Then, we consider the formation of equilibria in the legislature for alternative policy instruments and the consequent choice of political outcomes. Finally, we discuss alternative approaches to modeling this political market.

2.4.1 Aggregation of demand for policy instrument support

Typically, more than one interest group will be pressing for support from the legislature. How is such interest group demand to be aggregated? In our framework, the most obvious approach for aggregating interest-group demand functions might be simply to sum, at each level of willingness-to-pay, the degrees of support each group demands at that price. Such demand aggregation makes sense for private goods, but the support the legislature provides is essentially a public good. Hence, an efficient approach might involve taking a given level of support and summing up what each interest group is (marginally) willing to pay for that degree of support; that is, vertical summation rather than horizontal summation of individual demands. Such an (efficient) approach is unlikely to reflect positive reality, however, as long as free-rider problems exist among interest groups. Therefore, the aggregate demand thus calculated represents the upper bound of actual aggregate demand, that is, the demand which would be experienced in the absence of free-riding.

2.4.2 Aggregation of supply of policy instrument options

Since, in this framework, the degree of support by individual legislators is denominated in terms of homogeneous units of 'effective support,' where the differences among legislators are incorporated in the production functions which underlie these individual marginal opportunity cost of effort functions (as well as the individual marginal (lobbying and electoral cost functions), the appropriate aggregation to derive the supply function for the legislature is the horizontal summation of the supply functions of individual legislators. As noted above, some legislators' supply functions may extend to the left of the vertical axis (for example, \( S_l \) in Figure 5.3), corresponding to opposition to the instrument in question. Therefore, when the individual legislator supply functions are horizontally added, the aggregate supply function for the legislature represents the relevant net supply of support. Like the supply function for an individual legislator, the aggregate function for some instruments may intersect the vertical axis at a positive price.

2.4.3 Equilibrium support in the legislature for a policy instrument

We treat the legislature as operating as if it were a competitive market for the support for policy instruments. Given the homogeneity of the commodity that is demanded and supplied, the number of members in the two houses of Congress, and the number of active interest groups, this seems like a reasonable first approximation. Thus, the equilibrium, aggregate level of 'effective support' provided for the policy instrument is that level for which aggregate supply equals aggregate demand (\( Q^* \) in Figure 5.4). This level is associated with a shadow price (\( P \) in Figure 5.4) representing the aggregate marginal willingness-to-pay for support in the legislature's equilibrium.

![Figure 5.4](https://via.placeholder.com/150)

**Figure 5.4** Aggregate demand and aggregate supply of political support and the formation of a legislative equilibrium

There are two cases of interest in which the aggregate supply and demand functions will not intersect in the politically relevant positive orthant. One is the case in which the demand function intersects the horizontal axis to the left of the legislature's 'aggregate preferred point' (see the gap between points \( B \) and \( E_s \) in Figure 5.5); that is, the maximum support demanded in the aggregate by interest groups (at zero price) is less than the legislature would provide on its own. In this case of 'excess supply,' it is reasonable to assume that the legislature will provide support at its preferred point (\( E_s \)). Given the likelihood of free-riding among interest groups, it would not be surprising if in certain instances the
aggregate demand by interest groups fell short of the support a strongly committed legislature was willing to provide absent any lobbying. In this case the competitive equilibrium price is zero, and so each legislator provides support at her own preferred point.

The political system (Figure 5.5) is a two-dimensional space where the vertical axis represents the degree of effective support and the horizontal axis represents aggregate political support. The demand for support the faces from interest groups, represented by the horizontal line through the point $P$ in Figure 5.3 (derived from the equilibrium in Figure 5.4). Thus, a set of legislators with supply functions represented by $S$, $S_2$, and $S_3$ (Figure 5.3) would provide effective support of $Q_1$, $Q_2$, and $Q_3$, respectively.

The legislator with supply function $S$ provides a negative level of support, that is, opposition. An interest group might benefit from contributing to this legislator in the hope of reducing her degree of active opposition, just as it can benefit by increasing the support of a friendly legislator. It would take a level of demand (and political compensation) equivalent to point $A$ in Figure 5.3 to move this same legislator to a position of inaction or indifference.

On the other hand, legislators such as those represented by $S_2$ and $S_3$ in Figure 5.3 derive benefits (negative costs) from supporting an instrument, no matter what the position of relevant interest groups. Not surprisingly, such friendly legislators end up supplying even greater levels of support in response to interest group demand.

2.4 Legislative outcomes

How do individual levels of support for policy instruments translate into policy outcomes? If our interest is in aggregate quantity of support (as defined), then total support is simply equal to the sum of the individual levels of equilibrium support, which is identical to the original market equilibrium. On the other hand, institutional processes that translate individual levels of support into a collective decision (for example, various kinds of voting mechanisms) may involve very different sorts of aggregation. In general, institutional features of the legislature will influence the nature of the appropriate aggregation. First, the committee structure of Congress (especially in the House of Representatives) gives different legislators widely different levels of influence over policy (Sherele and Weingast, 1987; Weingast and Marshall, 1988). Thus, legislators vary greatly in the effectiveness of the support they can supply for a given instrument. But in our framework, with its focus on degrees of effective support, this reality is already incorporated (through the political support production functions) and has no effect on the appropriate aggregation; it remains one of simple summation of individual equilibria. Second, legislative outcomes are affected by voting rules. The number of votes necessary for passage, taking into account the veto power of the executive, determines the level and distribution of support needed to pass a bill. Furthermore, the order of voting on amendments and the nature of the final vote also affect the outcome. This brings us to the important issue of how support is translated into votes. Whereas our ‘degree of support’ is a continuous variable, it may produce a binary variable, a vote. Any empirical implementation of this framework would need to address the linkage. For our purposes, however, we can focus on the reality that, in general, the policy instrument chosen will be the alternative that has garnered the greatest aggregate support.
3 DEMAND FOR ENVIRONMENTAL POLICY INSTRUMENTS

Demand-side explanations for the choice among environmental policy instruments can be separated into four sectors of regulatory demand: firms, environmentalists, consumers, and labor.

3.1 Firms

Firms will tend to demand the policy instruments that promise the highest profits (or the least losses) from regulation. While all environmental regulation imposes costs of compliance on firms, not all instruments impose the same costs to achieve a given regulatory goal. Positive political economy explanations of firm demand for environmental regulation can be divided into three principal categories: firm preferences for one instrument over another arising from lower aggregate costs of compliance to industry as a whole; the presence of rents and entry barriers; and differential costs of compliance across firms in a given industry.34

3.1.1 Lower aggregate costs to an industry as a whole

All else being equal, firms will naturally tend to prefer regulatory instruments that have lower aggregate costs for the industry as a whole. Because market-based approaches are likely to be more cost-effective than command-and-control instruments, this suggests that private industry, as a whole, would be more supportive of market-based approaches in general. However, there is a crucial distinction between the aggregate costs for society and aggregate costs for private industry. Cost-effective instruments, by definition, minimize costs to society, but they vary in the proportion of that cost they place on polluters. The use of market-based instruments does not guarantee that firms’ compliance costs will be less than those under command-and-control.

We can expect that firms will oppose regulatory instruments that shift a greater cost burden onto industry. For example, the virtually unanimous opposition by private industry to pollution taxes can be explained by the fact that under such schemes firms pay not only their private costs of compliance, but also the costs of tax payments to the government for all residual emissions.

Similarly, under tradable permit schemes, firms bear equivalent costs if the initial distribution of the permits is by means of an auction. In contrast, under a tradable permit scheme with grandfathered permits, existing firms do not bear any cost for their residual emissions.35

These arguments suggest that private industry, as a whole, will prefer grandfathered permits and standards to other instruments. Grandfathered permits are cost-effective and minimize the burden placed on industry—at least on existing firms. Emissions standards may not fare as well on the total-cost criterion, but are likely to be preferred by firms over auctioned permits or taxes.

3.1.2 Generation of rents and creation of entry barriers

Certain types of regulations can actually augment firms’ profits through the generation of rents and the creation of entry barriers. Consider an industry made up of identical firms in a long-run competitive equilibrium. If the government imposes a command-and-control standard which sets an allowable level of pollution for each firm, where firms can meet the standard only by reducing their output, the standard will lead to reduced total production and therefore an increase in price along the aggregate demand curve (Buchanan and Tullock, 1975). If the environmental restriction is not exceptionally severe, the new price will be above average cost for all firms, and firms will earn rents. Hence, in this very simple model, firms may prefer standards to no regulation at all, and firms will prefer standards to taxes, since a tax is a charge for a resource which otherwise is free.36

Firms, however, are not limited to the single response of cutting output. They can also reduce emissions by adopting a new technology or changing their input mix. In this more general and realistic scenario, depending on the stringency of the standards and other factors, command-and-control standards can still have the effect of providing rents to regulated firms (Maloney and McCormick, 1982). Here, too, under certain conditions, firms may prefer command-and-control standards to no regulation at all.37

The enhanced industry profitability that results from rents will be sustainable over the long term only in the presence of entry restrictions. Thus, firms regulated by a rent-generating instrument, such as command-and-control standards, will benefit if that instrument is linked to a mechanism that imposes barriers to entry. In theory, such a mechanism might prohibit new entry outright, but a more politically feasible approach would impose higher costs on new entrants (Steigler, 1971; Ravallion and Zupan, 1991).

This body of theory helps explain why private firms (and their trade associations) may have strong demands for command-and-control standards, which create rents, and especially for considerably more stringent command-and-control standards for new sources, which create barriers to entry.38 The theory thereby provides the beginnings of an explanation for the prevalence of such instruments in US environmental law. Further, theory indicates that under certain conditions the regulated industry will be better off under such a scheme than under no regulation.

Although the theoretical arguments are strong, there are no conclusive empirical validations of these demand-side propositions. Direct empirical tests of firm demand for instruments—such as analyses of resources devoted to
lobbying for instruments as a function of firms’ stakes in an issue – are virtually non-existent. Instead, most empirical work in this area simply seeks to measure the benefits an industry receives under regulation. Thus, it is not instrument demand that is examined, but an underlying premise for such demand. Maloney and McCormick (1982) employed financial market analysis in two regulatory cases to test whether the value of regulated firms, as measured by stock market prices, was positively affected by the announcement of regulations, as the economic theory of regulation would suggest. They found that the discount standards promulgated by the US Occupational, Safety, and Health Administration (OSHA) raised the asset value of cotton producers, consistent with the notion that regulation increased firms’ profits by creating rents. But a more comprehensive study by Hughes, Magat, and Ricks (1986) reached the opposite conclusion. This discussion also provides a positive political economy explanation for why market-based instruments have virtually always taken the form of grandfathered tradable permits, or at least of why private firms should be expected to have strong demands for the means of permit allocation. In tradable permit schemes, grandfathering: (1) conveys scarcity rents to firms, since existing polluters are granted valuable economic resources for free; and (2) provides entry barriers, in that new entrants must purchase permits from existing holders. Hahn and McGarland (1989) provide anecdotal evidence for rent-seeking in the decision-making process over the Environmental Protection Agency’s (EPA) implementation of the Montreal Protocol restricting the use and production of chlorofluorocarbons (CFCs). They argue that a rent-seeking model explains the positions of large producers, such as DuPont, which supported grandfathered tradable permits and opposed other implementation schemes, including an auction proposal.

The preceding discussion does not provide a compelling explanation for the prevalence of command-and-control standards over grandfathered tradable permits. In principle, either instrument could provide sustainable rents to existing firms. We must search elsewhere for positive political economy explanations of this phenomenon.

3.1.3 Differential costs across firms in an industry
A different explanation for the landscape of environmental policy instruments arises from the existence of differential costs of environmental compliance across firms. Because of this heterogeneity, a firm may support policy instruments that impose costs on it, as long as those costs affect it less than the industry average and thus give it a competitive advantage (Leone and Jackson, 1981; Oster, 1982). For example, firms with large refineries for which lead reduction involved relatively low costs were supportive of the tradable permit system by which the leaded content of gasoline was reduced in the 1980s (Kerr and Mate, 1995), whereas firms with smaller refineries were vehemently opposed.55

Similarly, the largest producers of CFCs – DuPont and Imperial Chemical Industries – supported a ban on CFCs in large part because they were best able to develop substitutes (Oye and Maxwell, 1995). Other empirical work, however, has cast doubt on the proposition that firms advocate instruments based on inter-industry or intra-industry transfers. Leone and Jackson (1981) found that legislators with a paper producer in their districts voted against water pollution control legislation, regardless of whether that producer stood to gain or lose relative to its competitors.

Another form of cost differential arises as a result of the erection of barriers to entry. It is important to distinguish here between the entry of new firms and the expansion of existing firms. The entry barriers of environmental regulation generally apply to both situations. Thus, within an industry, firms with no plans to expand would derive a greater benefit from entry barriers, which could discourage further growth by their competitors.

Conversely, firms with ambitious expansion plans relative to their existing operations would benefit from weaker barriers. Such firms might also try to structure barriers in a manner that would give them an advantage over newcomers. For example, the ‘bubble’ program of the Clean Air Act makes these barriers less onerous for existing firms because they can engage in intra-firm emissions trading. Under this program, a firm can reduce the emissions of an existing source by an amount at least equal to the emissions of the new source, instead of having to take the more costly step of meeting the command-and-control standard otherwise applicable to new sources. The Clean Air Act’s “netting” policies, which allow intra-firm trading across time periods, also make expansion by an incumbent easier than entry by a new firm.

The mechanism for allocating tradable permits might also produce different winners and losers within an industry. Under a grandfathering scheme that allocated permits on the basis of emissions at the time of establishment of the tradable permit scheme, firms that invested in pollution abatement prior to regulation stand to lose, relative to those more heavily polluting competitors (Hahn and Noll, 1990). Such firms might conceivably prefer the allocation of permits by means of an initial auction.

3.2 Environmental Organizations
As noted above, we anticipate that the utility of an environmental advocacy group will be affected by both the organization’s well-being and the level of environmental quality. First, organizational well-being may be measured partly by budgetary resources, which are a function of donor contributions. This financial concern can affect an organization’s demand for specific policy instruments if such support attracts members, persuades donors to make contributions, or, more broadly, increases the visibility and prestige of the organization. Hence, an
organization’s demand for a given policy instrument is likely to be affected (ceteris paribus) by several factors: the likelihood that the instrument will be chosen by policy makers;* the degree to which the organization can be clearly identified with supporting the instrument; the magnitude of potential funding gains due to distinguishing itself from other environmental groups; and the ability to offer donors and members a compelling argument, on environmental-quality grounds, in support of the instrument.

A prominent example is provided by the Environmental Defense Fund’s (EDF) enthusiastic and effective support of the SO2 allowance trading system adopted as part of the Clean Air Act Amendments of 1990. With the Bush administration eager to back up the President’s claim of being “the environmental President,” and with key senior staff in the administration having strong pre-dispositions to the use of market-based approaches, the proposal had a chance of succeeding. EDF had already become a champion of market-based approaches to environmental protection in other, less nationally prominent, domains. Now it faced an opportunity to strengthen that position and solidify its reputation as a pragmatic environmental organization willing to adopt new strategies involving less confrontation with private industry. By supporting tradeable permits, EDF could seize a market niche in the environmental movement, distinguishing itself further from other groups. Importantly, EDF was able to make a powerful argument for tradable permits on environmental, as opposed to economic, grounds: the use of a cost-effective instrument would make it politically possible to achieve greater reductions in sulfur dioxide emissions than would otherwise be the case.

EDF is an outlier in this realm. Most environmental advocacy groups have been relatively hostile towards market-based instruments. This should not be terribly surprising. Considering their interest in strengthening environmental protection, environmental organizations might be expected to prefer command-and-control approaches to market-based schemes for three reasons. The first reason is philosophical: environmentalists have portrayed pollution taxes and tradable permits as “licenses to pollute” (Kelman, 1981), and they have vociferously concerns that damages from pollution – to human health and to ecological wellbeing – are difficult or impossible to quantify and monetize, and thus cannot be summed up in a marginal damage function or captured by a Pigouvian tax rate (Kelman, 1981).

Second, environmental organizations may oppose market-based schemes on strategic grounds. Once implemented, permit levels and tax rates may be more difficult to alter than command-and-control standards. If permits are given the status of “property rights,” an attempt to reduce pollution levels in the future may meet with “take-ins” claims and demands for government compensation (Hahn and Noll, 1990). This concern, however, can be alleviated by an explicit statutory provision like that contained in the acid rain provisions of the Clean Air Act Amendments of 1990 stating that permits do not represent property rights, or by “sunset” provisions that specify a particular period of time during which a permit is valid.

Likewise in the case of pollution taxes, if increased tax rates become desirable in response to new information about a pollutant or about the response of firms to the existing taxes, adjustment may be unlikely because raising tax rates is politically difficult. Furthermore, taxes have long been treated as “political footballs” in the United States (as in the recent case of calls to reduce gasoline taxes). Hence, environmental organizations might oppose pollution taxes out of fear that they would be reduced or eliminated over time. A related strategic reason for why environmentalists might oppose the use of tax instruments is that a shift from command-and-control to tax-based environmental regulation would shift authority from environment committees in the Congress, frequently dominated by pro-environment legislators, to tax-writing committees, which are generally more conservative (Kelman, 1981).

Third, environmental organizations may object to decentralized instruments on technical grounds. Although market-based instruments are theoretically superior in terms of cost-effectiveness, problems may arise in translating theory into practice (Hahn and Axel, 1995). For example, an emission tax or tradable permit scheme can lead to localized “hot spots” with relatively high levels of ambient pollution. While this problem could be addressed through the use of permits or charge systems that are denominated in units of environmental degradation (Revesz, 1996), the design of such systems might be perceived as excessively cumbersome.

### 3.3 Labor

Since unions seek to protect jobs, they might be expected to oppose instruments likely to lead to plant closings or other large industrial dislocations. Under a tradable permit scheme, for example, firms might close their factories in heavily polluted areas, sell permits, and relocate to less polluted areas (Hahn and Noll 1990). In contrast, command-and-control standards have generally been tailored to protect aging plants. The threat of factory dislocation is a likely explanation of support from northern, urban members of Congress for the “prevention of significant deterioration” (PSD) policy in clean air regulation, which has discouraged movement of industry from urban areas in the north-east, to high-quality air sheds in the south and west (Crandall, 1983; Pachigian, 1985).

Depending on the trade-offs between job creation effects and job preservation effects, labor might support stricter standards for new sources.

There are other examples of labor concern over the choice of environmental policy instruments. In the 1977 debates over amendments to the Clean Air Act, eastern coal miners’ unions fought to include a command-and-control
standard that effectively required scrubbing, thereby seeking to ensure continued reliance on cheap, high-sulfur coal from the east, over cleaner western coal (Ackerman and Hansher 1981). Likewise, in the debates over the SO2 allowance trading system in the 1990 amendments to the Clean Air Act, the United Mine Workers opposed the system because it would create incentives for the use of low-sulfur coal from largely non-unionized mines in Wyoming’s Powder River Basin instead of high-sulfur coal from eastern, unionized mines.

3.4 Consumers

Consumer groups typically have not expressed strong demands for environmental policies because of obstacles to organizing, arising from free-rider and limited-information problems. To the extent that they do have preferences over instruments, we would expect them to favor those instruments that minimize any increases in the prices of consumer goods and services, and this would seem to suggest cost-effective (hence, market-based) instruments over command-and-control. In practice, however, organized consumer groups have tended to ally themselves with environmental organizations on most issues, pursuing environmental-quality interests, rather than broader consumer interests. The latter concerns have more often been voiced by ‘taxpayer organizations,’ but these groups usually do not become involved in the relative minutiae of choosing environmental policy instruments. Hence, environmental interest groups have been effectively unopposed by other public interest organizations.

4 SUPPLY OF ENVIRONMENTAL POLICY INSTRUMENTS

There are several plausible positive political economy explanations for the nature of the supply of environmental policy instruments. First, legislators and their staffs are thought to be predisposed by their predominantly legal training to favor command-and-control approaches in regulation (Kneese and Schultze 1975). Similarly, unfamiliar policy instruments may require legislators to spend time learning about them before they can provide substantial support, thereby giving rise to a status quo bias in favor of the current regime of command-and-control regulation.53 Both these effects may become weaker in the coming years, as a result of the increasing understanding of economics among lawyers as well as among legislators and their staffs (Hahn and Stavins, 1991).44

Second, ideology plays a significant role in instrument choice. Kelman (1981), in his survey of congressional staff members, found that support and opposition to effluent charges was based largely on ideological grounds: Republicans who supported the concept of pollution charges, for example, offered as a reason the assertion that ‘the free market works,’ or ‘less government intervention’ is desirable, without any real awareness or understanding of the economic arguments for market-based programs. Likewise, Democratic opposition was largely based upon analogously ideological factors (that is, greater faith in the government as opposed to the private sector), with little or no apparent understanding of the real advantages or disadvantages of the various instruments.

Third, constituents react to their perceptions of the costs and benefits to themselves and others of a particular policy, regardless of the real costs and benefits (McCutin and Sullivan, 1984; Hahn, 1987). The more visible the benefits, the greater the demand for an instrument; the more visible the costs, the greater the opposition and thus the political costs to the legislator. Hence, politicians are likely to prefer command-and-control instruments because they tend to hide the costs of regulation in the price increases passed on to consumers (McCutin and Sullivan, 1984). In contrast, market-based instruments, although they impose lower total costs, generally impose those costs directly, in the form of effluent charges or prices paid for permits. Grandfathered permits fare better on the visibility criterion than auctioned permits or taxes since no money is exchanged at the time of the initial allocation.

Fourth, voters’ limited information may also lead politicians to engage in symbolic politics: the use of superficial slogans and symbols to attract constituent support, even when the policies actually implemented are either ineffectual or inconsistent with the symbols employed. Such symbolism offers the legislator political benefits at little opportunity cost. Command-and-control instruments are likely to be well suited to symbolic politics, because strict standards — strong statements of support for environmental protection — can be readily combined with less visible exemptions (Hahn and Noll, 1990). Congress has on several occasions passed environmental laws with strict compliance standards, while simultaneously including lax or insufficient enforcement measures. Tradable permits and taxes offer neither the powerful symbolic benefits of declaring strict standards, nor an convenient a range of options to undermine their practice.

Fifth, if politicians are risk averse, they will prefer instruments that involve more certain effects. Considering environmental policy instruments, uncertainty is likely to arise with respect to the distribution of costs and benefits among the affected actors and to the implementation of the legislative decision by the bureaucracy. The flexibility inherent in permits and taxes creates uncertainty about distributional effects and local levels of environmental quality (McCutin and Page, 1986). Typically, legislators are more concerned with the distribution of costs and benefits — in particular their geographic distribution — than with a comparison of total benefits and costs (Hahn and Stavins, 1991). For this reason, aggregate cost-effectiveness — perhaps the major advantage of market-based instruments — is likely to play a less significant role in the legislative calculus.
than whether a politician is getting the best deal possible for her constituents (Shepsle and Weingast, 1984). Moreover, politicians are likely to oppose instruments (such as tradable permit schemes) that might induce firms to close business and relocate elsewhere, leading to localized unemployment (Hahn and Noll, 1990). Although there will be winners as well as losers from such relocation, potential losers are likely to be more certain of their status than potential gainers. This asymmetry creates a bias in favor of the status quo.46

For the same reason, grandfathering of tradable permits is more likely to attract a winning coalition than auctions, since grandfathering allows leeway in rewarding firms and distributing the costs and benefits of regulation among jurisdictions. Allocating permits by grandfathering can produce fairly clear ‘winners’ and ‘losers’ among firms and states, as demonstrated by the distribution of sulfur dioxide emissions permits in the 1990 amendments to the Clean Air Act (Jenckes and Schmalensee, 1995). An auction, on the other hand, would allow no such political maneuvering.

Sixth, command-and-control instruments offer Congress greater control concerning the implementation of legislative outcomes by administrative agencies. To ensure that the interests of the winning coalition are protected in implementation, Congress may, in effect, prescribe administrative rules and procedures that favor one group over another (McCubbins, Noll, and Weingast, 1987). Such a practice, in theory, protects intended beneficiaries of legislation by constraining the scope of subsequent executive intervention in implementation. If stacking the deck is an important aspect of policy making, it is more likely to be successful in the context of command-and-control legislation.

Market-based instruments leave the allocation of costs and benefits up to the market, treating polluters identically (Hahn and Noll, 1990). Standards, on the other hand, allow the administrative agency greater control and therefore open up possibilities for stacking the deck. For example, Congress might place the burden of proof in standard-setting on the administrative agencies to favor industry; or legislators might include citizen-suit provisions allowing legal action to force the enforcement of standards favoring environmental groups.

Seventh, bureaucrats are less likely to undermine the legislative decision if their preferences over policy instruments are accommodated. Administrative decision makers are likely to oppose decentralized instruments on several grounds: they are familiar with command-and-control regulation; and market-based instruments imply a scaled-down role for the agency by shifting decision making from the bureaucracy to private firms, thereby undermining the prestige of the agency and the job security of its staff (Hahn and Stavins, 1991).

5 CONCLUSIONS

We have attempted to synthesize the seemingly diverse strands of the positive political economy literature by viewing them as relating to component parts of a political market framework. In this framework, interest groups have demands for particular instruments. Legislators, in turn, provide political support for such instruments. The demands of the various interest groups are aggregated, as are the supplies of support from individual legislators. The interaction of such aggregate demand and supply produce a legislature’s equilibrium level of aggregate support, with each member simultaneously determining her effective support level. The effective support levels of the various legislators are combined, in an institutional context, to produce the legislature’s choice of policy instrument.

This framework is far from complete. We have focused on the decisions of individual legislators, while leaving unanswered questions of how individual (and continuous) legislator support translates into binary votes and how such support or votes are aggregated to the level of the legislature. For example, we do not deal with competition among legislators, only briefly have we considered the role congressional committees and other institutions play in structuring and influencing instrument choice, and we have not explained how instrument choices are framed. Likewise, we have only explored a competitive legislative model as a first approximation, and have commented briefly on alternative approaches. These issues represent promising avenues for extending this framework and building a workable model of instrument choice.

In this chapter, we have taken a modest step toward a unified framework for positive analysis of policy instrument choice. This framework may permit greater understanding than approaches that focus almost exclusively on one component of the problem at a time. Thus, for example, if one considers only the benefits a particular industry derives from a proposed regulatory program, one might be led to conclude that a program will be forthcoming if the benefits are sufficiently high. Attention to questions of supply shows why this might not be the case. If the legislature prefers the status quo to the instrument demanded by the interest group, and if the legislature’s aggregate supply function is sufficiently inelastic, there may be no equilibrium under which the legislature provides positive support for the demanded instrument. Indeed, the supply function of such a legislature might be above the industry demand function everywhere in the politically relevant domain. Similarly, whether a large shift in the demand for a particular instrument resulting from exogenous factors causes a comparable shift in the actual support provided by the legislature depends on the elasticity of supply. There will be relatively little change in equilibrium support if supply is inelastic; but a far larger change if supply is elastic.

This framework helps us to organize and, to some degree, synthesize available explorations of the four gaps with which we introduced the paper—three gaps
between economic prescription and political reality and one gap between past and current political practices. With respect to the first – the predominance of command-and-control over market-based instruments despite the economic superiority of the latter – firms are likely to prefer command-and-control standards to auctioned permits and taxes. Standards produce rents, which can be sustainable if coupled with sufficiently more stringent requirements for new sources. In contrast, auctioned permits and taxes require firms to pay not only abatement costs to reduce pollution to a specified level, but also costs of polluting up to that level. Environmental interest groups are also likely to prefer command-and-control instruments, for philosophical, strategic, and technical reasons.

On the supply side, command-and-control standards are likely to be supplied more cheaply by legislators for several seasons: the training and experience of legislators may make them more comfortable with a direct standards approach than with market-based approaches; the need to learn about market-based instruments may represent significant opportunity costs; standards tend to hide the costs of pollution control while emphasizing the benefits; plus standards may offer greater opportunities for symbolic politics. Finally, at the level of the legislature, command-and-control standards offer legislators a greater degree of control over the distributional effects of environmental regulation. This feature is likely to make majority coalitions easier to assemble, because legislative compromise is easier in the face of less uncertainty, and because the winning coalition can better guarantee that its interests will be served in the implementation of policy.

The second gap – that command-and-control standards have been used, the standards for new sources have been far more stringent than those for existing sources, despite the potentially perverse incentives of this approach – can also be understood in the context of our market framework. Demand for new source standards comes from existing firms, which seek to erect entry barriers to restrict competition and protect the rents created by command-and-control standards. In turn, environmentalists often support strict standards for new sources because they represent environmental progress, at least symbolically. On the supply side, more stringent standards for new sources allow legislators to protect existing constituents and interests by placing the bulk of the pollution control burden on unbuilt factories.

Many of these same arguments can also be used to explain the third gap: the use of grandfathered tradable permits as ex ante market-based mechanism in the United States, despite the disadvantages of this allocation scheme. Like command-and-control standards, tradable permits create rents; grandfathering distributes those rents to firms, while auctioning transfers the rents to government. Moreover, like stringent command-and-control standards for new sources, but unlike auctioned permits or taxes, grandfathered permits give rise to entry barriers. Thus, the rents conveyed to the private sector by grandfathered tradable permits are, in effect, sustainable.

Moreover, grandfathered tradable permits are likely to be less costly for legislators to supply. The costs imposed on industry are less visible – and less burdensome – for grandfathered permits than for auctioned permits or taxes. Also, grandfathered permits offer a greater degree of political control over the distributional effects of regulation, facilitating the formation of majority coalitions. In both these respects, grandfathered permits are somewhat analogous to command-and-control standards.

The fourth and final gap – between the recent rise of the use of market-based instruments and the lack of receptiveness such schemes had encountered in the past – can be credited to several factors. These include the increased understanding and familiarity with market-based instruments; niche-seeking by environmental groups interested in both environmental quality and organizational viability; increased pollution control costs, which create greater demand for cost-effective instruments; attention to new, unregulated environmental problems without constituencies for a status quo approach; and a general shift of the political center toward a more favorable view of using the market to solve social problems. Overall, the image is one of both demand and supply functions shifting rightward, thus leading, over time, to greater degrees of political support for these market-based instruments.

To the extent that some of the current preference for command-and-control standards reflects simply a desire to maintain the regulatory status quo, the aggregate demand for a market-based instrument is likely to be greatest and the political-opportunity costs of legislators providing support is likely to be least when the status quo instrument is essentially non-existent, that is, when the environmental problem has not previously been regulated (Hahn and Stavins 1991). Hence, in the future, we should be more optimistic about introducing such market-based instruments for "new" problems, such as global climate change, than for existing, regulated problems, such as abandoned hazardous waste sites.

We end with some thoughts about how a market framework can generate empirical work on the positive political economy of instrument choice for environmental regulation. So far, most of the academic work in this area has been theoretical; very few arguments have been subjected to empirical validation. Several of the existing empirical studies have addressed the question of why firms might support particular instruments, rather than whether firms actually provide such support. There have been no empirical studies that have constructed demand functions by determining how much firms actually are willing to pay – for example, in the form of lobbying expenses and campaign contributions – to secure particular outcomes. Similarly, there has been no work seeking to determine the nature of demand by interest groups other than industry. In particular, the motives of environmental organizations merit more considera-
dation. We have discussed the possible self-interested motives of such organizations, and how their demands for particular policy instruments may be motivated by niche seeking. But whether their expenditures in the political process comport with this theory remains essentially untested.

On the supply side, there are substantial impediments to empirical work. The existing studies have primarily attempted to determine the factors that affect legislative votes on particular programs (for example, Hamilton, 1965; Railroad, 1985). In recent years, however, Congress has enacted a greater proportion of legislation by voice vote, rather than recorded vote. There has also been a shift from votes on comparatively narrow bills to votes on omnibus bills, which make it virtually impossible to determine a legislator’s actual position with respect to specific components. Thus, there is now less new data than previously with which to perform studies of legislative voting behavior.

Legislative voting studies also share a substantial problem: distinguishing votes which reflect a legislator’s true views about bills from votes cast as part of an implicit logrolling trade, in which a legislator votes in favor of a program that the otherwise opposes in order to obtain a more valuable quid pro quo. Moreover, as we argued above, a vote constitutes only one component of the support that a legislator can extend to a bill. But the other components of support, of course, are less well suited to quantitative analysis. Thus, in some cases, the best way to explore empirically the supply side of the equilibrium framework may be through detailed case studies of the legislative decision making process, as that undertaken by Ackerman and Hassler (1981).

The metaphor of the market will, in the end, be an imperfect and incomplete description of political behavior. But there are real advantages to considering instrument choice within this framework, and from developing more fully the details of the market metaphor and its implications. The ultimate test of the usefulness of such a framework will be the extent to which it enables reliable predictions of the choices legislators make, and the extent to which it facilitates the design of policy instruments that are both economically rational and politically successful.

NOTES

1. Helpful comments on a previous version of the paper were provided by David Chayin, Cary Coglianese, John Flanigan, Don Fullerton, Robert Huber, James Hamilton, Robert Keohane, David King, Lewis Kromhoff, Robert Lowry, Roger Noll, Robert Schoof, Kenneth Shepsle, and Richard Stewart. Financial support was provided by the Dean’s Research Fund, John P. Kennedy School of Government, and the Pilottor D’Agostino and Max E. Greenberg Research Fund at the New York University School of Law. The authors alone are responsible for remaining errors.

2. "Silo-based" or "economic incentive" policy instruments—in addition to policies that charge and systems of tradable permits—are those which dig private incentives with social objective to control pollution through direct policy mechanisms or the creation of transferable property rights. While notable work on pollution taxes (Pigou 1920) or transferable permits, see Davis (1986) and Montgomery (1972). At least in theory, pollution taxes and systems of marketable permits, under appropriate conditions, achieve emissions reductions at minimum total cost (Rasmussen and Denton, 1986). Incentive-based instruments also have dynamic efficiency properties (Mills and Prince, 1989; Jaffe and Stavins, 1985). Command-and-control standards include design standards, which require the use of a particular technology to control emissions, and (more commonly) performance standards, which prescribe the maximum amount of pollution that a source can emit (usually in proportional terms, as a quantity of allowable emissions per unit of product output or input). In this chapter, we use "standards" as a generic term for command and control standards, and except where stated otherwise, we refer to proportion standard.

3. New plans ought to have somewhat more stringent standards because their abatement costs are higher; however, such standards should be linked with actual abatement costs, and not with the proxy of plant string. Pot empirical evidence on this point, see McFadden and Brady (1988); Nelson, Tienberg, and Doull, 1986).

4. Taxes (so-called net charges) have been used in some communities for municipal solid waste collection (U.S. Congress, Office of Technology Assessment, 1995). Gasoline taxes serve primarily as revenue raising instruments, rather than environmental (Pigovian) taxes per se. Interestingly, the European experience with the revenue; environmental taxes appear to be more prevalent than tradable permits, although the taxes employed have typically been too low to induce significant air emissions reductions (Dienes, 1989). A more comprehensive positive analysis of instrument choice is provided in the book on European and U.S. experiences.

5. For discussion of the relevant conditions, see: Wertheim, 1974; Yeh, 1976; Stavins, 1995.

6. Although the sulfur dioxide allowance program established by the 1980 Clean Air Act Amendments includes several actions, these involve less than 3% of the total allocation (Bailey, 1986).

7. With perfect information and no transactions costs, the efficient outcome will result regardless of how permits are initially distributed (Montgomery, 1972; Coase, 1960). Under more realistic scenarios, however, auctioning is superior to a grants of cost-effectiveness (Savas, 1986; "green recycling") (Gottlieb, Parry, and Buttrum, 1986; Fuller and Metcalf, 1990), and the incentives facing firms to reduce emissions (Dewees, 1983; Hahn and McFadden, 1989).

8. Beginning in the 1970s, the US Environmental Protection Agency (EPA) offered states the option of employing various costs of tradable permits for the control of local, criteria air pollutants (Huber, 1989). More significantly, tradable permits systems were used in the 1990s to accomplish the phasing out of lead in gasoline (Kemp and Marc, 1995) and to facilitate the phased-down of ozone-depleting chlorofluorocarbons (CFCs), and in the 1990s cut nationwide SOx emissions by 50 percent by the year 2005 (U.S Environmental Protection Agency, 1996), to achieve national ozone emissions in the northeast, and to implement stricter local air pollution controls in the Los Angeles metropolitan region.

9. We do not intend, however, to deny the importance of executive branch departments and administrative agencies, such as the EPA. For example, the intra-agency emissions trading program of the 1970s was largely the direct creation of EPA.

10. Space does not permit us to review the considerable body of work in the economics and public choice literatures that seek to explain general patterns of economic regulation. This literature is well reviewed in Romer and Rosenthal (1987). A few theoretical works have advanced frameworks rather than a market model for considering the choice of policy instruments; see especially Campos (1989), Kahn (1989), and Eskin and Yovanovitch (1991).

11. It might be argued that interest groups ultimately care about votes, which at the level of an individual legislator reduces to a binary variable. But there are several reasons to focus on support, rather than on votes alone. First, this approach facilitates comparisons among several instruments, since the outcome of the legislative process is the instrument that gains the most effective support. Second, empirical analysis has largely failed to link campaign contributions with legislators’ votes (Bjol and Wayman, 1990), while campaign contributions have been found
Environmental economics

18. Up to this point, we have examined lobbying activities of interest groups, exclusively in terms of their demand-side effects. It can also be argued that some of these activities are intended to and may succeed at shaping legislators’ supply functions. We examine this possibility below.

19. This notion of legislation’s “goals” is consistent with Fenno’s (1973) description of Congressmen as having three basic objectives: re-election, influence within the House, and good public policy. In our framework, “influence within the House” and “good public policy” are combined in “being a legislator.” If the legislators wishes to continue to be a legislator in the future, he will also value re-election.

20. In the face of the overwhelming claims on her time and resources—both in Washington and in her home district—a Congresswoman’s time and effort centers on a significant opportunity cost (Blume, Pool, and Dieno, 1965; Kingdon, 1989; Fenno, 1978). Effort invested in providing support for one bill could have been spent on another that would satisfy ideological goals, reflect voters’ objectives, and/or attract votes, dollars, and other resources or assist the home district and supplying constituency services such as help dealing with the bureaucracy (Dennunzio and Menger, 1986; Gerh and Manger, 1989). To keep the explication simple, the marginal cost function is assumed in the figures to be linear.

21. Congressmen tend to take into account the preferences of the people who voted for them, that is, their “supporting coalition” (Kingdon, 1989) or their re-election constituency (Fenno, 1978). A conservative legislator whose re-election constituency is anti-regulatory, for example, will not be affected by a minority group of environmentalists calling for communtal and communal regulation.

22. In the figure, we represent both ideological costs and electoral costs as being positive, that is, support for the policy is essentially inconsistent both with the legislator’s own ideology and his constituents’ preferences. It is not inconceivable that these could be of opposite sign, but in a representative democracy, that would be the exception, not the rule. As stated by Fenno (1978, p. 142): “if your conscience and your district disagree too often...members like to say, ‘you’re in the wrong business.’”

23. Party leaders may conceivably also become effective gatekeepers for policy instrument support by offering various incentives to legislators in return for support, so as to ensure that the party leaders are essentially functioning as interest groups.

24. We simply take the choice set of instruments as given. Important questions remain regarding how it was determined, but these are beyond the scope of this chapter.

25. This issue of aggregation matters on the more general issue of choice among interest groups for influence. The classic model associated with Steger (1973) and Putnam (1976) is essentially a policy auction in which the interest group with the highest bid gains control over expenditures. In Becker’s (1985) model, one group is used, the other subsidized, and each tries to improve its lot at the expense of the other. More recently, Epstein and O’Halloran (1997) model direct interest group competition in a game in which the legislature’s vote is private information.

26. Alternatively, we might treat individual legislatures as monopoly suppliers of unique services, each one setting its marginal opportunity cost equal to its “marginal revenue” generated by interest groups’ demand for policy. Such an extreme case of monopoly supplier seems to be a less reasonable approximation of political reality than perfect competition, but it illustrates the potential for considering alternative models of imperfect competition. Various models of co-operative and non-co-operative oligoply could capture significant elements of legislative relationships. For the purposes of this paper, however, we proceed with the basic competitive model.

27. Hal and Wayman (1960) examine legislator participation in committees, and argue that interest groups give contributions to “bespoke” legislators in order to reduce their participation, that is, this opposition.

28. In the US Congress, in so far as a familiar example, a bill needs a bare majority in the House of Representatives, but may have to clear a higher hurdle in the Senate to bring closer to debate. If the President vetoes the bill, of course, both majority in both houses are required to enact legislation.

29. In the Congress, as LBD is modified by successful amendments, is considered opposed the status quo in the final vote. This arrangement favors the status quo and magnifies that each bill be compared ultimately with the status quo rather than with other alternatives.
Environmental economics

30. For example, discrete-choice econometric models that have as their theoretical basis the existence of an unobserved latent variable on divisional and marketing research on the demand for new products, it is possible to estimate the parameters of such models using a technique called 'discrete- choice' econometrics. This technique involves the estimation of separate equations for each possible outcome, with the dependent variable being a dummy variable that takes on the value of 1 if the event occurs and 0 otherwise. The estimated coefficients can then be used to calculate the probability of each outcome occurring, given certain explanatory variables.

31. There are also plausible explanations for firms' preferences. Firms may simply want to avoid the costs of regulation and enforcement, which can be substantial. In addition, firms may be more concerned with the costs of innovation and development than with the costs of compliance.

32. Thus, it is not surprising that firms often choose to comply with environmental regulations, even when doing so may not be in their economic interests. This is because firms may be concerned about the reputational costs of non-compliance, which can be substantial. In addition, firms may be more concerned with the costs of non-compliance than with the costs of compliance.

33. One way to improve the accuracy of environmental forecasts is to incorporate more sophisticated models of human behavior into the analysis. This can be done by using more advanced econometric techniques, such as panel data analysis, to estimate the parameters of the models. In addition, it is important to consider the potential for feedback effects, in which changes in the environment can lead to changes in human behavior, which in turn can lead to further changes in the environment.

34. Of course, the potential for feedback effects also means that the results of environmental forecasts should be interpreted with caution. It is important to consider the potential for self-fulfilling prophecies, in which people's beliefs about the environment can lead to changes in their behavior, which in turn can lead to changes in the environment.

35. Another important finding is that the potential for feedback effects is likely to be greater in the case of long-term forecasts than in the case of short-term forecasts. This is because the potential for feedback effects is likely to be greater in the case of long-term forecasts than in the case of short-term forecasts.

36. The results of this study suggest that the potential for feedback effects is likely to be greater in the case of long-term forecasts than in the case of short-term forecasts. This is because the potential for feedback effects is likely to be greater in the case of long-term forecasts than in the case of short-term forecasts.

37. Further research is needed to better understand the potential for feedback effects and to develop more sophisticated models of human behavior.

38. In addition, it is important to consider the potential for feedback effects, in which changes in the environment can lead to changes in human behavior, which in turn can lead to further changes in the environment.

39. It is also important to consider the potential for feedback effects, in which changes in the environment can lead to changes in human behavior, which in turn can lead to further changes in the environment.

40. In conclusion, the potential for feedback effects is likely to be greater in the case of long-term forecasts than in the case of short-term forecasts. This is because the potential for feedback effects is likely to be greater in the case of long-term forecasts than in the case of short-term forecasts.

Instrument choice in environmental policy

41. We need to distinguish here between strategic and tactical decisions by advocacy groups. The strategic decision by an environmental organization to express demand for a policy instrument is based on considerations of likely political utility, regardless of the probability of success. On the other hand, tactical decisions to allocate resources to express demand for an instrument already on the agenda may be significantly affected by the probability of success.

42. This is a critical point that is often overlooked. The fact that environmental organizations can express demand for policy instruments is a significant advantage. By expressing demand, environmental organizations can help to ensure that policy instruments are developed and implemented, even if doing so is not immediately apparent.

43. Whether or not the issue is important is a separate question. The more important it is, the more likely the organization will be to express demand in the hope that it will lead to eventual political action. The issue of whether or not an organization is likely to express demand is of interest, but the issue of whether or not it is important is of greater concern.

44. The fact remains, though, that the issue is important. By expressing demand, environmental organizations can help to ensure that policy instruments are developed and implemented, even if doing so is not immediately apparent.