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THE CHOICE OF REGULATORY INSTRUMENTS IN ENVIRONMENTAL POLICY

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I. INTRODUCTION

The design of environmental policy requires answers to two central questions: (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 has diverged strikingly from the recommendations of normative economic theory. The purpose of this Article is to explain why.

Four gaps between normative theory and positive reality merit particular attention. First, so-called "command-and-control" instruments (such as design standards requiring a particular technology's usage, or performance standards prescribing the maximum amount of pollution that a source can emit)¹ are used to a significantly greater degree than "market-based" or "economic-incentive" instruments (principally pollution taxes or charges² and systems of trade-

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1. Performance standards could specify an absolute quantity of permissible emissions (that is, a given quantity of emissions per unit of time), but more typically these standards establish allowable emissions in proportional terms (that is, quantity of emissions per unit of product output or per unit of a particular input). This Article uses the term "standard" to refer somewhat generically to command-and-control approaches. Except where stated otherwise, the Article refers to proportional performance standards.

2. The development of the notion of a corrective tax on pollution is generally

able permits³), despite economists' consistent endorsement of the latter.

At least in theory, market-based instruments minimize the aggregate cost of achieving a given level of environmental protection,⁴ and provide dynamic incentives for the adoption and diffusion of cheaper and better control technologies.⁵ Despite these advantages, market-based instruments have been used far less frequently than command-and-control standards.⁶ For example, the cores of the Clean Air Act ("CAA")⁷ and Clean Water Act ("CWA")⁸ consist of federally prescribed emission and effluent standards, set by reference to the levels that can be achieved through the use of the "best available technology."⁹

Second, when command-and-control standards have been used, the required level of pollution abatement has generally been far more stringent for new pollution sources than for existing ones,

credited to Pigou. See generally ARTHUR CECIL PIGOU, *THE ECONOMICS OF WELFARE* (1920).

3. John Dales initially proposed a system of tradeable permits to control pollution. See generally JOHN H. DALES, *POLLUTION, PROPERTY, & PRICES* (1968). David Montgomery then formalized this system. See generally W. David Montgomery, *Markets in Licenses and Efficient Pollution Control Programs*, 5 J. ECON. THEORY 395 (1972). However, much of the literature can be traced back to Ronald Coase. See Ronald H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1, 39-44 (1960).

4. As is well known, a necessary condition for the achievement of such cost-minimization is that the marginal costs of abatement be equal for all sources. See WILLIAM J. BAUMOL & WALLACE E. OATES, *THE THEORY OF ENVIRONMENTAL POLICY* 177 (1988). In theory, pollution taxes and systems of marketable permits induce this effect, at least under specified conditions.

5. Market-based systems can provide continuous dynamic incentives for adoption of superior technologies, since under such systems it is always in the interest of firms to clean up more if sufficiently inexpensive cleanup technologies can be identified. See Scott R. Milliman & Raymond Prince, *Firm Incentives to Promote Technological Change in Pollution Control*, 17 J. ENVTL. ECON. & MGMT. 247, 257-61 (1989); Adam B. Jaffe & Robert N. Stavins, *Dynamic Incentives of Environmental Regulation: The Effects of Alternative Policy Instruments and Technology Diffusion*, 29 J. ENVTL. ECON. & MGMT. S43, S43-S46 (1995).

6. OFFICE OF TECH. ASSESSMENT, *TECH. ASSESSMENT BOARD OF THE 103D CONGRESS, ENVIRONMENTAL POLICY TOOLS: A USER'S GUIDE* 27-28 (1995).

7. See 42 U.S.C. § 7411(a),(b) (1994).

8. See 33 U.S.C. §§ 1311(b), 1316 (1994).

9. We use this label as a generic one. The various statutory schemes employ somewhat different formulations. See, e.g., 33 U.S.C. § 1311(b)(1)(A) (1994) ("best practicable control technology"); *id.* § 1311(b)(2)(A) ("best available technology"); *id.* § 1316(a)(1) ("best available demonstrated control technology"); 42 U.S.C. § 7411(a)(1) (1994) ("best system of emission reduction"); *id.* § 7479(3) ("best available control technology").

possibly worsening pollution by encouraging firms to keep older, dirtier plants in operation.¹⁰

The federal environmental statutes further these disparities by bifurcating the regulatory requirements that apply to new and existing sources. For example, under the Clean Air Act, emission standards for new sources are set federally, whereas the corresponding standards for existing sources are set by the states.¹¹ Similarly, the CAA's Prevention of Significant Deterioration ("PSD") program,¹² which applies to areas with air that is cleaner than the National Ambient Air Quality Standards ("NAAQS"),¹³ imposes additional emission standards only on new sources.¹⁴ The Clean Water Act sets effluent limitations for both new and existing sources, but these limitations are governed by different statutory provisions.¹⁵

Third, in the relatively rare instances in which they have been adopted, market-based instruments have nearly always taken the form of tradeable permits rather than emission taxes,¹⁶ although economic theory suggests that the optimal choice between trade-

10. New plants ought to have somewhat more stringent standards because their abatement costs are lower, although such standards should be linked with actual abatement costs, not with the proxy of plant vintage. When new source standards are sufficiently more stringent, however, they can give rise to an "old-plant" effect, precluding plant replacements that would otherwise take place. See Matthew D. McCubbins et al., *Structure and Process, Politics, and Policy: Administrative Arrangements and the Political Control of Agencies*, 75 VA. L. REV. 431, 467 (1989); Richard B. Stewart, *Regulation, Innovation, and Administrative Law: a Conceptual Framework*, 69 CAL. L. REV. 1259, 1270-71 (1981). Empirical evidence shows that differential environmental regulations lengthen the time before plants are retired. See Michael T. Maloney & Gordon L. Brady, *Capital Turnover and Marketable Pollution Rights*, 31 J.L. & ECON. 203, 206 (1988); Randy Nelson et al., *Differential Environmental Regulation: Effects on Electric Utility Capital Turnover and Emissions*, 75 REV. ECON. & STAT. 368, 373 (1993).

11. Compare 42 U.S.C. § 7411(a), (b) (1994) (defining federal standards for new sources) with *id.* § 7410(a) (requiring state plans for existing sources).

12. See 42 U.S.C. §§ 7470-7479 (1994).

13. See *id.* § 7471.

14. See *id.* § 7475(a).

15. Compare 33 U.S.C. § 1316 (1994) (prescribing standards for new sources) with *id.* § 1311(b) (setting standards for existing sources).

16. Taxes (so-called unit charges) have been used in some communities for municipal solid waste collection. See OFFICE OF TECH. ASSESSMENT, *supra* note 6, at 119-21. Gasoline taxes serve primarily as revenue-raising instruments, rather than environmental (Pigouvian) taxes per se. Interestingly, the European experience is the reverse: environmental taxes are far more prevalent than tradeable permits, although the taxes employed have typically been too low to induce much pollution abatement. See Richard B. Stewart, *Economic Incentives for Environmental Protection: Opportunities and Obstacles* 42 (1996) (unpublished manuscript, on file with New York University). A more comprehensive

able permits and emission taxes is dependent upon case-specific factors.¹⁷ Moreover, the initial allocation of such permits has been through "grandfathering," or free initial distribution based on existing levels of pollution,¹⁸ rather than through auctions, despite the apparently superior mechanism of auctions.¹⁹ Despite diversity of

positive analysis of instrument choice than we provide here would seek to explain this difference between the European and U.S. experiences.

17. With perfect information, tradeable permits sold at auction have the same effect as a tax. Under conditions of uncertainty, the relative efficiency of tradeable permits and fixed tax rates depends upon the relative slopes of the relevant marginal benefit and marginal cost functions. See Martin L. Weitzman, *Prices v. Quantities*, 41 REV. ECON. STUD. 477, 485-90 (1974); Gary W. Yohe, *Towards a General Comparison of Price Controls and Quantity Controls Under Uncertainty*, 45 REV. ECON. STUD. 229, 238 (1978); Robert N. Stavins, *Correlated Uncertainty and Policy Instrument Choice*, 30 J. ENVTL. ECON. & MGMT. 218, 219-25 (1996).

In theory, a hybrid system that incorporates aspects and attributes of both a simple linear tax or a simple tradeable permit system will be preferable, under conditions of uncertainty, to either alone. See Marc J. Roberts & Michael Spence, *Effluent Charges and Licenses Under Uncertainty*, 5 J. PUB. ECON. 193, 196-97 (1976); LOUIS KAPLOW & STEVEN SHAVELL, ON THE SUPERIORITY OF CORRECTIVE TAXES TO QUANTITY REGULATION 12-14 (National Bureau of Econ. Research Working Paper No. 6251, 1997).

18. Mandated by the Clean Air Act amendments of 1990, the sulfur dioxide ("SO₂") allowance program (a tradeable permit program to reduce acid rain) provides for annual auctions in addition to grandfathering. However, such auctions involve less than three percent of the total allocation. See ELIZABETH M. BAILEY, ALLOWANCE TRADING ACTIVITY AND STATE REGULATORY RULINGS: EVIDENCE FROM THE U.S. ACID RAIN PROGRAM 4 (Mass. Inst. of Tech. Working Paper No. MIT-CEEPR 96-002, 1996). These auctions have proven to be a trivial part of the overall program. See PAUL L. JOSKOW ET AL., AUCTION DESIGN AND THE MARKET FOR SULFUR DIOXIDE EMISSIONS 27-28 (National Bureau of Econ. Research Working Paper No. 5745, 1996).

19. With perfect information and no transactions costs, trading will result in the economically efficient outcome independently of the initial distribution of permits. See W. David Montgomery, *Markets in Licenses and Efficient Pollution Control Programs*, 5 J. ECON. THEORY 395, 409 (1972); Coase, *supra* note 3, at 15; Robert W. Hahn & Roger G. Noll, *Designing a Market for Tradeable Emission Permits*, in REFORM OF ENVIRONMENTAL REGULATION 120-21 (Wesley Magat ed., 1982). Under more realistic scenarios, however, there are compelling arguments for the superiority of auctioned permits. First, auctions are more cost-effective in the presence of certain kinds of transactions costs. See Robert N. Stavins, *Transaction Costs and Tradeable Permits*, 29 J. ENVTL. ECON. & MGMT. 133, 146 (1995). Second, the revenue raised by an auction mechanism can be used to finance a reduction in some distortionary tax. See LAWRENCE H. GOULDER ET AL., REVENUE-RAISING VS. OTHER APPROACHES TO ENVIRONMENTAL PROTECTION: THE CRITICAL SIGNIFICANCE OF PRE-EXISTING TAX DISTORTIONS 1 (National Bureau of Econ. Research Working Paper No. 5641, 1996). Instruments that restrict pollution production (such as tradeable permits) can create entry barriers that raise product prices, reduce the real wage, and exacerbate preexisting labor supply distortions. However, this effect can be offset if the government auctions the permits, retains the scarcity rents, and recycles the revenue by reducing distortionary labor taxes. See Don Fullerton & Gilbert Metcalf, *Environmental Regulation in a Second-Best World* 6, 25 (1996) (unpublished manuscript, on file with authors). Third, auctions provide greater incentives for firms to develop substitutes for regulated products, by requiring firms to pay for permits rather than giving them rents. See Robert W. Hahn & Albert M. McGartland, *The Political Economy of Instrument Choice: An Examination of the U.S. Role in Implementing the Montreal Protocol*, 83 Nw.

available market-based instruments (taxes, revenue-neutral taxes, auctioned permits, and grandfathered permits)²⁰ and the numerous tradeoffs that exist in normative economic terms, the U.S. experience has been dominated by one choice: grandfathered permits.

Notably, the acid rain provision of the Clean Air Act allocates, without charge, marketable permits for sulfur dioxide emissions to current emitters.²¹ Similarly, grandfathered marketable permits are created by the offset mechanism of the nonattainment provision of the CAA.²² This mechanism permits existing sources to reduce their emissions and sell the resulting reduction to new sources attempting to locate in the area.²³

Fourth and finally, there has been a conceptual gap between prior and current political practice. In recent years, the political process has been more receptive to market-based instruments,²⁴

U. L. REV. 592, 604 (1989). Fourth, the revenue raised by auctions may provide administrative agencies with an incentive to monitor compliance. See Bruce A. Ackerman & Richard B. Stewart, *Reforming Environmental Law*, 37 STAN. L. REV. 1333, 1344-46 (1985). Fifth, grandfathering, if accepted as general practice, could lead unregulated firms to increase their emissions in order to maximize the pollution rights that they obtain if there is a transition to a market-based system. See Donald N. Dewees, *Instrument Choice in Environmental Policy*, 21 ECON. INQUIRY 53, 62-63 (1983).

20. In a straightforward scheme of effluent taxes, a constant tax is levied on each unit of pollution. In a revenue-neutral framework, the tax revenues are then rebated to the payors, by some method other than the amount of their pollution. In marketable permit schemes, the initial allocation can be performed through an auction, or through grandfathering. In a deterministic setting and abstracting from a set of other issues, a revenue-neutral emission tax can be designed which is equivalent to a grandfathered tradeable permit system. Likewise, under such conditions, a simple emission tax will be roughly equivalent to an auctioned permit system.

21. See 42 U.S.C. § 7651(b) (1994). The amount of the allocation is capped in Phase I, which is currently in effect, at 2.5 pounds of sulfur dioxide per million BTUs of fuel input consumed. In Phase II, which goes into effect in the year 2000, the cap will be 1.2 pounds of sulfur dioxide per million BTUs of fuel input consumed. See Paul L. Joskow & Richard Schmalensee, *The Political Economy of Market-based Environmental Policy: The 1990 U.S. Acid Rain Program*, 41 J.L. & ECON. (forthcoming April 1998) (manuscript at 94-95, on file with authors).

22. See 42 U.S.C. § 7503(a)(1)(A) (1994).

23. See *id.* at § 7503(c)(1).

24. Beginning in the 1970s, the U.S. Environmental Protection Agency ("EPA") allowed states to implement trading schemes, as alternatives to command-and-control regulation, in their State Implementation Plans under the Clean Air Act. See Robert W. Hahn, *Economic Prescriptions for Environmental Problems: How the Patient Followed the Doctor's Orders*, J. ECON. PERSP., Spring 1989, at 95, 101. More significantly, tradeable permit systems were used in the 1980s to accomplish the phasedown of lead in gasoline. See SUZI KERR & DAVID MARÉ, EFFICIENT REGULATION THROUGH TRADEABLE PERMIT MARKETS: THE UNITED STATES LEAD PHASEDOWN 3-6 (U. Md. C. Park Working Paper No. 96-06, 1997). Moreover, such systems facilitated the phasedown of ozone-depleting

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 four gaps between normative theory and positive reality. While some explanations emerge from formal theories, others take the form of informal hypotheses, purporting to explain certain aspects of environmental policy, but not as a part of a formal theory of political behavior. This Article reviews, evaluates, and extends these explanations. Moreover, this Article places these disparate explanations within the framework of an equilibrium model of instrument choice in environmental policy, based upon the metaphor of a political market.

Informed by intellectual traditions within economics, political science, and law, this framework organizes and synthesizes existing theories and empirical evidence about observed departures of normative prescription from political reality. The scope of the Article, however, is limited in a number of respects. The emphasis is on the control of pollution rather than the management of natural resources. The Article treats Congress, rather than administrative agencies, as the locus of instrument choice decisions; it views legislators (rather than regulators) as the "suppliers" of regulation.²⁵ Moreover, the Article focuses exclusively on the choice among the policy instruments used to achieve a given level of environmental protection, ranging from tradeable permits to taxes to standards. It does not explore the related issues of how the level of protection is chosen or enforced. Nor does it address why Congress chooses to delegate authority to administrative agencies in the first place.²⁶ Finally, the Article's outlook is positive, not normative: it seeks to

chlorofluorocarbons ("CFCs") and are projected to cut nationwide SO₂ emissions by 50% by the year 2005, see OFFICE OF AIR RADIATION, U.S. ENVIRONMENTAL PROTECTION AGENCY, 1995 COMPLIANCE RESULTS: ACID RAIN PROGRAM 10-11 (1996), as well as achieving ambient ozone reductions in the northeast and implementing stricter local air pollution controls in the Los Angeles metropolitan region.

25. We do not intend, however, to deny the importance of executive branch departments and administrative agencies, such as the EPA. For example, the intra-firm emission trading programs of the 1970s were largely the direct creation of EPA.

26. See generally Morris P. Fiorina, *Legislative Choice of Regulatory Forms: Legal Process or Administrative Process?*, 39 PUB. CHOICE 33 (1982).

understand why the current set of tools exists, rather than which tools are desirable.

Part II of the Article reviews the relevant intellectual traditions in economics, political science, and law. Part III presents the key features of our equilibrium framework. Part IV considers the demand for environmental policy instruments, while Part V examines the supply side. Finally, Part VI presents some conclusions.

II. INTELLECTUAL TRADITIONS

Positive theories of policy instrument choice find their roots in the broader study of government regulation, a vast literature which has been reviewed elsewhere.²⁷ For the purposes of this Article, the literature can be divided into three approaches for explaining government regulation: demand-driven explanations, supply-driven explanations, and explanations incorporating the interaction between demand and supply.

A. Demand-Side Analyses

Explanations that focus heavily on the demand for regulation are grounded largely in economics. Not surprisingly, economists have generally concentrated on the demand for economic (rather than social) regulation, devoting most attention to the interests of affected firms. The "economic theory of regulation," initiated by George Stigler²⁸ and developed further by Richard Posner,²⁹ Sam Peltzman,³⁰ and Gary Becker,³¹ suggests that much regulation is not imposed on firms but rather demanded by them, as a means of harnessing the coercive power of the state to restrict entry, support

27. See generally Thomas Romer & Howard Rosenthal, *Modern Political Economy and the Study of Regulation*, in *PUBLIC REGULATION: NEW PERSPECTIVES ON INSTITUTIONS AND POLICIES* 73 (Elizabeth E. Bailey ed., 1987).

28. See generally George J. Stigler, *The Theory of Economic Regulation*, 2 *BELL J. ECON.* 3 (1971).

29. See generally Richard A. Posner, *Theories of Economic Regulation*, 5 *BELL J. ECON.* 335 (1974).

30. See generally Sam Peltzman, *Toward a More General Theory of Regulation*, 19 *J.L. & ECON.* 211 (1976).

31. See generally Gary S. Becker, *A Theory of Competition Among Pressure Groups for Political Influence*, 98 *Q.J. ECON.* 371 (1983).

prices, or provide direct cash subsidies.³² A related strand of literature has likewise emphasized rent-seeking behavior.³³

In a number of these economic analyses, the supply side (i.e., the political process itself) is virtually ignored.³⁴ One paper typifying this demand-driven approach has examined private industry's preferences for regulation and has simply assumed that those policy preferences will prevail.³⁵ Similarly, another model of the resource allocation decisions of competing interest groups has assumed that the policy outcome depends solely on the relative pressures exerted by interest groups.³⁶

Even when they model political processes, economic explanations of regulation have often remained driven by the demand of firms. In Stigler's analysis³⁷ and Peltzman's elaboration,³⁸ the state enacts the program of the industry (or, more generally, of the interest group) offering the most resources to the governing party; in other words, regulation goes to the "highest bidder."³⁹ Thus, private industry will tend to be regulated where and when the benefits to firms from government regulation are highly concentrated, but the costs are widely dispersed.⁴⁰ The "government" sim-

32. Stigler's influential paper has been characterized as breaking with a previously dominant view (among economists) that regulation is initiated to correct market imperfections. See Stigler, *supra* note 28, at 3; see also Posner, *supra* note 29, at 343. It is worth noting that as far back as E.E. Schattschneider, political scientists recognized the importance of economic interests among groups pressuring Congress. See E.E. SCHATTSCHNEIDER, *POLITICS, PRESSURES, AND THE TARIFF* 4 (1935). The "capture theory of regulation" in political science was already well developed by the time of Stigler's work. Stigler's main contribution was less his recognition that economic interests will seek favorable regulation than his introduction of that insight into the economics literature and his application of economic models of behavior (i.e., treating political parties as resource maximizers) to explain policy formulation.

33. See generally JAMES M. BUCHANAN & GORDON TULLOCK, *THE CALCULUS OF CONSENT* (1962); Gordon Tullock, *The Welfare Cost of Tariffs, Monopolies, and Theft*, 5 W. ECON. J. 224 (1967).

34. See generally JEAN-JACQUE LAFFONT & JEAN TIROLE, *A THEORY OF INCENTIVES IN PROCUREMENT AND REGULATION* (1993); Romer & Rosenthal, *supra* note 27.

35. See James M. Buchanan & Gordon Tullock, *Polluters' Profits and Political Response: Direct Controls Versus Taxes*, 65 AM. ECON. REV. 139, 142 (1975).

36. See Becker, *supra* note 31, at 392.

37. See Stigler, *supra* note 28, at 12.

38. See Peltzman, *supra* note 30, at 214.

39. The Stigler-Peltzman model is essentially a policy auction. See Stigler, *supra* note 28, at 12-13; Peltzman, *supra* note 30, at 212.

40. Peanut regulation provides an excellent example of the effect of concentrated benefits and diffuse costs. Quotas, import restrictions, and price supports combined in 1982-1987 to transfer an average of \$255 million a year from consumers to producers, with a deadweight loss of \$34 million. The annual cost to each consumer was only \$1.23; each peanut farmer, on the other hand, gained \$11,100. Peanut farmers clearly had an

ply acts to maximize an exogenous "political support function" and thus caters to the more powerful group. Following a conceptually similar tack, another model pictures a single policymaker's decision as responding to a weighted sum of industry interests and environmental interests.⁴¹

Political actors are included in these analyses, but they are treated as economic agents reacting somewhat mechanically to the resources or the demands of interest groups. In many cases, as in the Stigler-Peltzman model, they have no interest other than collecting political contributions. Moreover, government is treated as a monolith, controlled by a single political party, with regulatory agencies and legislatures combined into a single unit. These accounts leave no room for constituency pressures, variation among legislators, slack between legislative direction and the actions of administrative agencies, or other supply-side phenomena.

B. Supply-Side Analyses

By contrast, political scientists and economists studying the supply side of regulation (and of legislation more generally) have focused on the voting behavior of legislators and the institutional structure of the legislature. The approach typically used by political scientists to explain voting behavior is based upon interview and survey data. On the basis of these sources, Congressmen are seen to be most influenced by colleagues and constituents in deciding how to vote.⁴² An alternative approach analyzes roll-call data to estimate the relative importance of ideology, constituent interests, and interest groups in legislative voting.⁴³ One study found that legislators base their votes not only on the economic interests of their constituents (as the economic theory of regulation as-

incentive to preserve the program, while any individual consumer had little to gain from dismantling it. See W. KIP VISCUSI ET AL., *ECONOMICS OF REGULATION AND ANTITRUST* 331 (1995).

41. See generally Robert W. Hahn, *The Political Economy of Environmental Regulation: Towards a Unifying Framework*, 65 *PUB. CHOICE* 21 (1990).

42. See JOHN W. KINGDON, *CONGRESSMEN'S VOTING DECISIONS* 17 (1989).

43. See generally Joseph P. Kalt & Mark A. Zupan, *Capture and Ideology in the Economic Theory of Politics*, 74 *AM. ECON. REV.* 279 (1984); James B. Kau & Paul H. Rubin, *Self-Interest, Ideology, and Logrolling in Congressional Voting*, 22 *J.L. & ECON.* 365 (1979); Sam Peltzman, *Constituent Interest and Congressional Voting*, 27 *J.L. & ECON.* 181 (1984).

sumes), but also on their ideologies.⁴⁴ Some scholars, notably Michael Munger and his colleagues, have sought to explain voting behavior by explicitly linking it to campaign contributions.⁴⁵ However, just as the Stigler-Peltzman model incorporates politicians but remains fundamentally demand-driven, their approach acknowledges the role of interest groups but is driven by supply-side factors. Some mention is made of the costs to legislators of supplying legislation to interest groups, but the models focus on estimating a "supply price" determined solely by the characteristics of legislators.⁴⁶

A second line of inquiry on the supply side has investigated the role of institutional structure in the legislature. The policy outcome in Congress depends not only on the voting preferences of individual legislators, but also on features such as decision rules, the order of voting, and especially the powers of committees (and their chairmen) to control the agenda of the legislature.⁴⁷ Further, expectations of subsequent problems of overseeing implementation of regulatory policy by administrative agencies may influence legislators in their choice of regulatory procedures and instruments.⁴⁸

C. Equilibrium Analyses

Compared to the above, relatively few works have taken an equilibrium approach by considering the interaction of the supply and demand for regulation. Those considering such linkages have

44. See Kalt & Zupan, *supra* note 43, at 298. Their econometric analysis has been criticized by John Jackson and John Kingdon. See John E. Jackson & John W. Kingdon, *Ideology, Interest Group Scores, and Legislative Votes*, 36 AM. J. POL. SCI. 805, 806 (1992).

45. See generally Arthur T. Denzau & Michael C. Munger, *Legislators and Interest Groups: How Unorganized Interests Get Represented*, 80 AM. POL. SCI. REV. 89 (1986); see also Kevin B. Grier & Michael C. Munger, *Comparing Interest Group PAC Contributions to House and Senate Incumbents, 1980-1986*, 55 J. POL. 615, 625-40 (1993).

46. In empirical studies of interest group contributions, a number of researchers seem to have in mind a "market model" of interest group contributions to legislators where interest groups offer campaign contributions and votes in return for political support. See Jonathan I. Silberman & Garey C. Durden, *Determining Legislative Preferences on the Minimum Wage: An Economic Approach*, 84 J. POL. ECON. 317, 328 (1976); Garey C. Durden et al., *The Effects of Interest Group Pressure on Coal Strip-Mining Legislation*, 72 Soc. Sci. Q. 239, 249 (1991).

47. See generally Kenneth A. Shepsle & Barry R. Weingast, *Positive Theories of Congressional Institutions*, 19 LEGIS. STUD. Q. 149 (1994) (reviewing recent literature on congressional institutions).

48. See Matthew D. McCubbins et al., *Administrative Procedures as Instruments of*

typically focused on the role of campaign contributions. Several researchers have modeled campaign contributions from profit-maximizing firms to vote-maximizing politicians,⁴⁹ where candidates choose optimal policy positions that balance the need to get votes (by moving towards the policy preferences of voters) and the need to secure campaign funds (by moving towards the preferences of contributors).⁵⁰ In a similar vein, some analysts have employed game-theoretic models to link campaign contributions by interest groups and policy positions adopted by legislators.⁵¹

One group considered legislative outcomes directly, modeling the determination of campaign contributions, legislators' floor votes, and constituents' votes, but without advancing a theoretical model of legislative behavior.⁵² Another researcher has explicitly considered the interaction of interest group demand and the legislative supply of policy instruments.⁵³ In his model, the choice of regulatory instrument is the equilibrium of a game between interest groups (who choose how much to allocate to lobbying in support of their preferred instrument) and legislators (who vote for the instrument that maximizes their support, taking into account the contributions from the interest groups).

Despite the relative scarcity of equilibrium models of positive political economy, the metaphor of a "political market" has frequently been employed in the public choice literature. The works using the market metaphor seem to have had three distinct markets in mind. One market is the market for votes *within* a legislature: legislators are at once demanders and suppliers of votes as they engage in vote trading and logrolling.⁵⁴ Other market models focus

Political Control, 3 J.L. ECON. & ORG. 243, 252-53 (1987); McCubbins et al., *supra* note 10, at 481.

49. See generally Uri Ben-Zion & Zeev Eytan, *On Money, Votes, and Policy in a Democratic Society*, 17 PUB. CHOICE 1 (1974).

50. Bental and Ben-Zion extend the model to consider the case where politicians derive utility from adopting a platform close to their personal policy preferences. See Benjamin Bental & Uri Ben-Zion, *Political Contribution and Policy—Some Extensions*, 24 PUB. CHOICE 1, 1-4 (1975).

51. See David Austen-Smith, *Interest Groups, Campaign Contributions, and Probabilistic Voting*, 54 PUB. CHOICE 123, 128-34 (1987).

52. See James B. Kau et al., *A General Equilibrium Model of Congressional Voting*, 97 Q.J. ECON. 271, 288-89 (1982).

53. See Jose Edgardo L. Campos, *Legislative Institutions, Lobbying, and the Endogenous Choice of Regulatory Instruments: A Political Economy Approach to Instrument Choice*, 5 J.L. ECON. & ORG. 333, 348-49 (1989).

54. In a "logroll," or vote trade, several legislators might arrange to vote for each

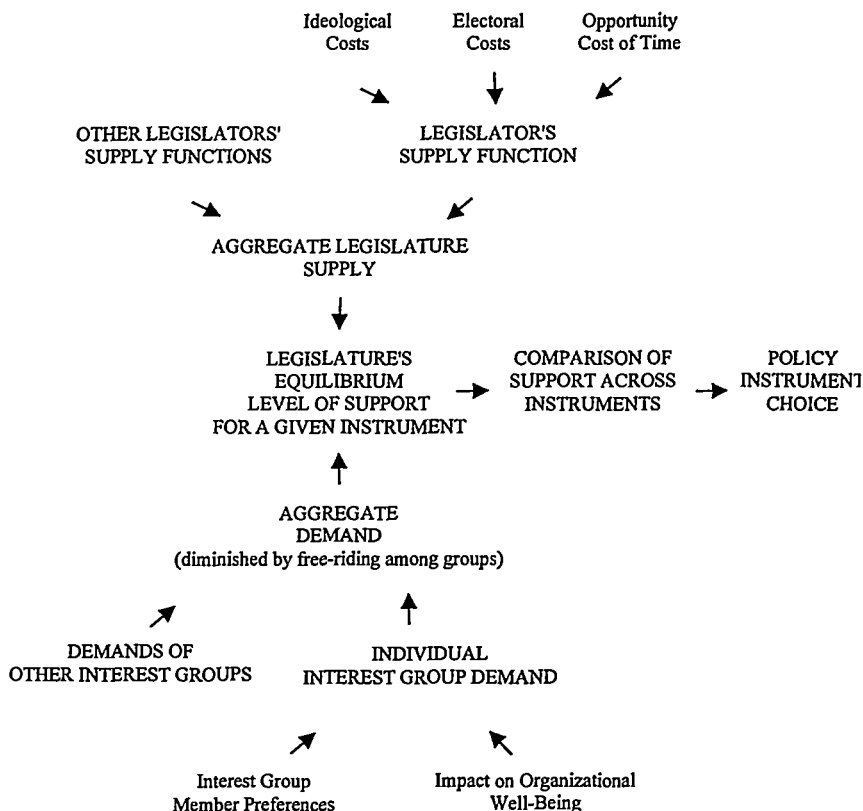


Figure 1

An Equilibrium Framework for Examining the Political Market

on the distribution of wealth resulting *from* legislation: the demanders are the beneficiaries of legislation and the suppliers are the losers, with politicians serving as brokers between the two groups.⁵⁵ This Article employs what is perhaps the most prevalent concep-

others' bills, so that each legislator secures her most preferred outcome in return for supporting other legislators' bills (which she may oppose only slightly if at all). For example, a series of public works projects might prompt a logroll, since each in the series matters a great deal to the representative whose district receives the funds, but is insignificant to other legislators.

55. See PUBLIC CHOICE THEORY at xviii (Charles K. Rowley ed., 1993).

tion of the "political market," one which focuses on the exchange between legislators and constituents or interest groups.⁵⁶

The remainder of this Article develops a new model of a political market involving legislators, constituents, and interest groups in the context of instrument choice in environmental policy. This market framework supplements existing work by simultaneously considering the demand for regulation, the supply of regulatory options, and the equilibrium outcome, that is, the choice of policy instrument in the legislature. In this way, the Article strives to synthesize prior research from the demand side and supply side, using it as a foundation for our own equilibrium framework. This Article also seeks to suggest a richer sense of the supply side than is found in existing equilibrium models,⁵⁷ incorporating legislator ideology as well as a fuller description of the opportunity costs of supplying legislation.⁵⁸

III. A MARKET FRAMEWORK FOR EXAMINING INSTRUMENT CHOICE

To develop a framework within which various existing positive political economy theories can be synthesized, consider a "political market" embodied in a legislature and focused on a single "commodity," namely legislators' support for a given instrument in a specific policy context.⁵⁹ A schematic view of this political market is provided in Figure 1. Demand for various degrees of support

56. In previous work, the identity of demanders and suppliers has varied; the market has been in electoral votes (with legislators "paying" for votes with legislation) and in legislation (with voters paying for the policies with their votes). Peltzman, for one, was clear that the demanders were constituents and the suppliers legislators: "[t]he essential commodity being transacted in the political market is a transfer of wealth, with constituents on the demand side and their political representatives on the supply side." See Peltzman, *supra* note 30, at 212. In this Article's framework, the market is in units of effective political support (for particular public policies).

57. See, e.g., Campos, *supra* note 53, at 338-48.

58. As noted above, Congress is seen as the locus of policy instrument choice. Extending the framework to cover regulatory agencies and the courts would introduce several interesting but complex issues. For regulatory agencies, for example, it is important to deal with issues such as the principal-agent relationship between the agency and Congress; the degree and nature of congressional oversight; the possibly conflicting goals of the agency head and career bureaucrats; the objective function of the bureaucrats (for example, job security, power, protection of expertise); and the way in which policy demanders provide payoffs to the agency.

59. "Specific policy context" simply refers to the fact that the demand for instru-

comes from diverse interest groups, including environmental advocacy organizations, private firms, and trade associations. The currency in this market takes the form of resources (monetary and other contributions, and/or endorsements or other forms of support) that can facilitate legislators' reelections. The aggregation of these individual demands is not a simple sum, because the public good nature of regulation means that interest groups can free-ride on the demands of others.

Next, it is assumed that each individual legislator seeks to maximize her expected utility, which involves the satisfaction that comes from being a member of the legislature, now and in the future. The result is the legislator's political-support supply function, the shape of which is determined by her ideological predisposition, her perception of her constituents' preferences, and the increasing opportunity cost of providing additional support for the policy instrument (in terms of expended effort, foregone future electoral votes in her home district, and discomfort associated with departures from her ideology). Since each legislator supplies units of a homogeneous product called "effective support" (at differing costs), the individual legislators' supply functions combine to yield an aggregate supply function at the level of the legislature.

Thus, for each instrument, a competitive equilibrium in the legislature is given by the intersection between the aggregate political-support supply function and the aggregation of relevant demands.⁶⁰ Levels of effective support provided by individual members of the legislature are hence equivalent to the amounts they are willing to provide at the competitive equilibrium "price," the points of intersection of their supply functions with the infinitely elastic demand they face. The aggregate support is simply the sum over legislators of their individual levels of effective support. The legislative outcome, i.e., the choice of a policy instrument, then depends upon the relative degrees of support generated for alternative policy instruments.

ments and the supply of instrument options are both linked to the specific environmental problems for which the instruments are being considered. Also, as discussed below, the legislature in this framework selects a policy instrument from among a range of options, including alternative policy instruments plus the status quo.

60. It is implicitly assumed that the effective support provided by individual legislators can be observed. This is a reasonable assumption in many but not all situations. Future work should explicitly incorporate this uncertainty.

The following sections describe the political market's commodity and currency, and then turn to more detailed expositions of the origins of regulatory demand and supply, respectively. Finally, the Article discusses the nature of political market equilibria and the legislative outcomes that result.

A. *The Political Market's Commodity and Currency*

Each legislator supplies some degree of support for a given regulatory instrument. Interest groups seek to secure support from legislators in the political market. The commodity of support is seen 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. This commodity may be characterized as "effective support."⁶¹ It is a measure of impact (output), not of effort (input).

61. 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 garners the most effective support. Second, empirical analysis has largely failed to link campaign contributions with legislators' votes, see Richard L. Hall & Frank W. Wayman, *Buying Time: Moneyed Interests and the Mobilization of Bias in Congressional Committees*, 84 AM. POL. SCI. REV. 797, 813 (1990), while campaign contributions have been found to be highly correlated with legislators' participation in committees, itself closely linked with the notion of "effective support[.]" See Grier & Munger, *supra* note 45, at 641; Jonathan I. Silberman & Garey C. Durden, *Determining Legislative Preferences on the Minimum Wage: An Economic Approach*, 84 J. POL. ECON. 317, 326-27 (1976). Third, the fate of most prospective legislation is determined before it reaches the floor for a vote. The agenda-setting powers of committees make them virtual arbiters of whether or not bills reach the floor for voting. See Kenneth A. Shepsle & Barry R. Weingast, *The Institutional Foundations of Committee Power*, 81 AM. POL. SCI. REV. 85, 87 (1987). Once a bill reaches the floor, norms of deference may lead many members of Congress to follow committee recommendations, either because of implicit logrolls among committees, see Barry R. Weingast & William J. Marshall, *The Industrial Organization of Congress, or, Why Legislatures, like Firms, Are Not Organized as Markets*, 96 J. POL. ECON. 132, 157-58 (1988), or because of recognition of committees' greater expertise. See KINGDON, *supra* note 42, at 133.

Votes of committee members are usually less critical than the intensity of members' support. See Richard L. Hall, *Participation and Purpose in Committee Decision Making*, 81 AM. POL. SCI. REV. 105, 105-06 (1987); DAVID R. MAYHEW, *CONGRESS: THE ELECTORAL CONNECTION* 92 (1974). Hence, securing the support of a relatively small number of legislators (each of whom is a highly efficient producer of effective support) may be the primary goal of interest groups, even though the groups ultimately care about the outcome of floor votes. This reality is captured by the above framework, with its focus on levels of "effective support."

To be sure, different legislators require different 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 chairs. Moreover, a legislator's effort 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 markup meetings, draft or sponsor legislation, insert statements into committee reports, propose amendments, seek to influence colleagues, or make behind-the-scenes deals.⁶²

The political currency in this market is seen as the resources necessary for the legislator's reelection: not only votes, but also monetary and other contributions.⁶³ 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" to legislators (such as time spent drafting legislation or policy information for the legislator) are also valued by a legislator seeking reelection, since association with the interest group may increase the legislator's support, and the time saved by the legislator may be spent on activities that generate home district votes. Incorporating home district votes, financial contributions, and nonmonetary contributions in the currency of "resources," the model adopts a monetary numeraire for convenience.

62. One set of researchers describes the range of services legislators can offer interest groups. See Denzau & Munger, *supra* note 45, at 91. Another group analyzes a similar measure of legislator participation, which they call "political support effort." See Silberman & Durden, *supra* note 61, at 318. Notably, these models generally treat as an output what in this framework is an input: namely, the effort exerted by the legislator to produce effective support. The above framework incorporates differences among legislators in effectiveness and productivity into the supply side (production of effective support) rather than the demand side (demand of interest groups for support from different legislators). For further discussion of the ways in which members of Congress participate in policy making, especially in committee, see Hall, *supra* note 61, at 106-08; RICHARD L. HALL, PARTICIPATION IN CONGRESS 40-48 (1996); Hall & Wayman, *supra* note 61, at 804-15.

63. Monetary contributions can be used to finance advertising campaigns, literature production and distribution, and other activities that increase the probability of a legislator being reelected.

B. Origins of Demand for Environmental Policy Instruments

The Article now explores the nature of demand by firms and individuals, dividing the latter category into three overlapping groups (consumers, workers, and environmentalists), and then considers the role of interest groups in the political market.⁶⁴

1. Firms and Individuals

Firms are affected by environmental regulation through the costs they incur to produce goods and services. Consider a price-taking firm⁶⁵ that wishes to maximize its profit from producing a single product and that employs a set of factors in its production, each of which has some cost associated with it. One of these input factors is the set of relevant features of the regulatory environment. In seeking to maximize profits, the firm chooses levels of all its inputs, including the efforts it puts into securing its desired regulatory environment. By solving this maximization problem, the firm derives its demand functions for all its inputs, including its demand for the environmental policy instrument. In this simple model, individual firms have a decreasing marginal willingness to pay to secure particular policy instruments.⁶⁶ At a minimum, a firm's demand for a policy instrument is a function of output and input prices, including the "price of legislators' support."⁶⁷

64. Of course, individuals and interest groups also play a role on the "supply side" of the political market by affecting legislators' electoral prospects. Individuals vote, while interest groups may spend resources to influence that vote directly (for example, by disseminating information about a legislator's voting record on an issue). Stated in terms of our framework, individuals and interest groups not only exhibit a demand function, but also may also shift legislators' supply functions. See *infra* Part III.C. This Article attempts to draw a conceptual distinction between these two facets of individual and interest group involvement.

65. In a competitive market economy, individual firms cannot independently set the price that they will charge (only monopolists can do this); rather, they must accept or "take" the price given by the competitively determined supply-demand equilibrium, and then decide how much to supply at that price.

66. The maximized objective function is the firm's profit function. Hotelling's Lemma (a basic microeconomic theorem) establishes that the factor demand functions are downward sloping as long as the profit function is convex.

67. This stylized framework implicitly assumes that firms are profit-maximizing (or cost-minimizing) atomistic units, and thus that there is no significant principal-agent slack between managers and shareholders. There is little doubt that this assumption departs from reality in many cases, but we leave its investigation to future research.

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,⁶⁸ or by the costs of environmental protection as 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. These effects can be reflected in a utility function, which the consumer maximizes subject to a budgetary constraint. The result is a set of demand functions for all private and public goods, including demand functions for any environmental policy instruments that affect the individual's utility either directly or indirectly. Thus, like firms, individuals can have a decreasing marginal willingness to pay to secure particular policy instruments.⁶⁹ Their demand for a policy instrument is a function of their income and of the relative prices of relevant goods, including the price of securing support for their preferred instrument.

Moreover, individuals can be categorized as "consumers," "environmentalists," and "workers"; these three categories are neither mutually exclusive nor exhaustive. Individuals are "consumers" to the degree that the choice of environmental policy instrument affects them through its impact on the prices of goods and services, "environmentalists" to the degree that they are affected by the impact of instrument choice on the level of environmental quality, and "workers" to the degree that they are affected by environmental

68. Although attention has been restricted at the outset to the policy instruments used to achieve a given level of protection, the choice of cost-effective instruments can lead to the adoption of more stringent environmental standards, as noted below.

69. The maximized utility function is the individual's indirect utility function. By Roy's Identity (a basic microeconomic truism), the demand functions are derived as downward sloping, as long as the utility function has the usual properties. It is possible that over a certain region the demand function will be increasing. For example, a unit of support for an instrument will be virtually worthless at very low levels of support, since adoption of that instrument will be extremely unlikely. Assume, however, that the demand function is decreasing over the politically relevant range, in which adoption of the instrument is a realistic possibility. It might be argued that if a legislature were composed of a single legislator and there was perfect information, demand functions for political support would (in the case of support relevant for voting) be a step function with a single step: interest groups would have no willingness-to-pay below some level of (adequate) support, and no willingness-to-pay above a sufficient level of support. But in a multi-member body, more support from individual legislators can always be worth something, and if there is uncertainty about how much support is sufficient, the demand function is likely to be downward sloping over at least some range.

policy through its impact on the demand for labor, and hence their wages.

2. Interest Groups

Because there are significant costs of lobbying and because the target of demand (i.e., the public policy) is a public good,⁷⁰ 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, such that individuals will undersupply lobbying, hoping instead to free ride on the efforts of others. Although some large firms maintain offices in Washington, D.C., to facilitate direct lobbying of Congress, most of the demand for public policies from both firms and individuals is transmitted through organized interest groups.

The free-riding problem standing in the way of individual lobbying efforts can also be a significant obstacle to the formation of interest groups.⁷¹ For an interest group to organize, it must overcome the free-riding problem by offering 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," namely the benefits derived from social interaction; and "purposive incentives," such as the personal satisfaction derived from membership in an organization whose activities one supports.⁷²

Among citizen groups, taxpayer and consumer organizations may face greater free-riding problems than environmental groups:⁷³

70. Regulation may not always be nonexclusive. Loopholes, narrowly applying clauses in statutes, and bureaucratic exemptions can all afford special treatment for some firms or narrowly defined categories of consumers. This possibility may provide enough incentive for some individual firms to lobby.

71. See MANCUR OLSON, *THE LOGIC OF COLLECTIVE ACTION: PUBLIC GOODS AND THE THEORY OF GROUPS* 43-44 (1965).

72. See LAWRENCE S. ROTHENBERG, *LINKING CITIZENS TO GOVERNMENT: INTEREST GROUP POLITICS AT COMMON CAUSE* 66 (1992); JAMES Q. WILSON, *POLITICAL ORGANIZATIONS* 33-35 (1995).

73. Notably, labor unions are able to overcome free-riding problems through mandatory dues payments. See OLSON, *supra* note 71, at 76; WILSON, *supra* note 72, at 119. To the extent that these funds are used for lobbying efforts, unions might be expected to be especially well-represented in the political arena. Yet, since unions dedicate most of

their lobbying actions are likely to have an even wider range of potential beneficiaries; they may be able to offer fewer material incentives; and they lack the compelling moral mission that may drive the purposive incentives motivating members of environmental groups.

To overcome their own set of free-rider problems, trade associations can offer a range of benefits to member firms 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.⁷⁴ 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.⁷⁵ Hence, private industry interests may be over-represented in the political process relative to citizen groups.

Importantly, interest groups do not simply aggregate the political demands of their members. Indeed, an interest group's utility maximization function may diverge significantly from those of its members as a result of a principal-agent problem: the members (and donors) are principals who contract with their agent—the interest group (or, more precisely, its professional staff)—to represent their views to the legislature.⁷⁶ As in many such contractual relationships, the output exerted by the agents may not be directly observable or controllable by the principal. This principal-agent problem is probably far more serious for environmental advocacy groups than for private industry trade associations.⁷⁷

their campaign contributions to securing favorable labor policy, unions as a group have only rarely been influential (or even active) in environmental policy debates.

74. See OLSON, *supra* note 71, at 139–41.

75. See WILSON, *supra* note 72, at 144.

76. In the typical principal-agent relationship, the principals (in this case, the firms) know their own interests and wish to ensure that the agent (here the trade association) acts in accordance with those interests. It is conceivable, however, that interest group staff may be leading the charge for policy changes that will benefit member firms, while those firms remain largely ignorant about the policy issues at stake. See RAYMOND A. BAUER ET AL., *AMERICAN BUSINESS AND PUBLIC POLICY* 331 (1963).

77. An environmental organization may have a hundred thousand members or more scattered across the country, paying scant attention to the operational priorities of the organization (let alone the details of its day-to-day activities). Trade associations, on the other hand, may be dominated by a large producer, with an incentive to monitor the association's activities, and their boards of directors may be made up of executives from member firms. Moreover, trade associations have many fewer members, and therefore the

Principal-agent slack between what the members want and what the interest group actually does arises because the organization's staff has its own self interests. 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 that affect the organization's health and viability.⁷⁸

With these competing interests and constraints in mind, an interest group must decide how to allocate its scarce resources as it lobbies the legislature for its preferred outcome. 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.

C. Origins of Supply of Environmental Policy Instruments

The Article now considers a legislator who derives utility from a number of relevant interests: 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

stake of each in the organization is greater, and monitoring is more likely to be worthwhile. On the other hand, trade associations have their own set of problems. Among these are the possible necessity of obtaining an expression of consensus from member firms prior to undertaking specific lobbying efforts.

78. One researcher treats the agency problem in environmental groups extensively, arguing that, because members and patrons cannot observe the outputs or effort of their agents directly, they must instead make funding and membership decisions based on a group's inputs: its expenditures on lobbying, member materials, advertising, and fund raising. See Robert C. Lowry, *The Political Economy of Environmental Citizen Groups* 94-96 (1993) (unpublished Ph.D. dissertation, Harvard University) (on file with the Harvard University Library).

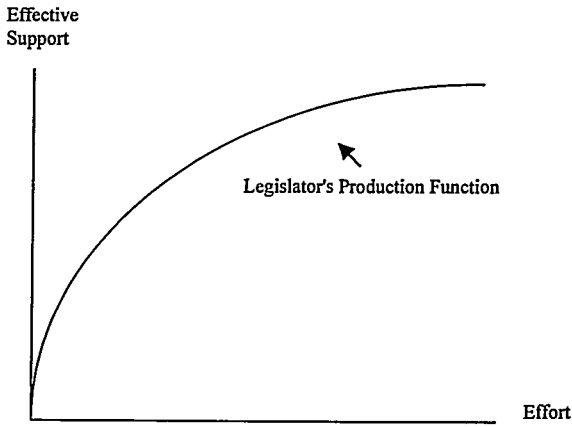


Figure 2
Political-Support Production Function

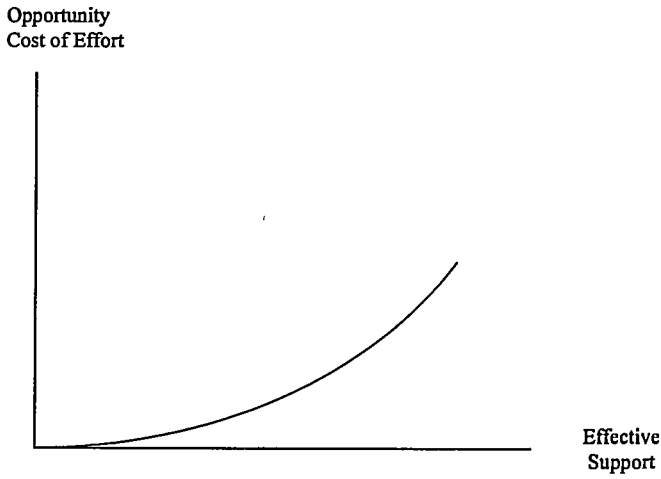


Figure 3
Political-Support Cost Function

reelected. Assuming that legislators seek to maximize their expected utility, a legislator will choose her level of support for a proposed policy instrument based on the effort required to provide that support, the inherent satisfaction she derives from providing that level of support, and the effects her position will likely have on her chances of reelection.⁷⁹

Accordingly, the legislator's supply function consists of three components: (1) the opportunity cost of efforts 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;⁸⁰ and (3) the opportunity cost (in terms of reduced probability of reelection) of supporting an instrument not favored by one's electoral constituency in terms of reduced probability of reelection.⁸¹

The first component emerges from the individual legislator's productivity in providing support. As indicated in Figure 2, the legislator's input is "effort"⁸² and the relevant output is "effective support." Some legislators may produce "effective support" more efficiently with a given amount of effort thanks to the size and effectiveness of their staffs, their seniority in the legislature, and their membership and leadership on relevant committees. By placing a value on the opportunity cost of time and effort, an opportunity cost function can be derived (Figure 3), and from that, the related marginal opportunity cost of effort, represented by the upward-sloping line emanating from the origin in Figure 4.⁸³

79. This notion of legislators' goals is consistent with other descriptions of Representatives as having three basic objectives: reelection, influence within the House, and good public policy. See RICHARD F. FENNO, JR., *HOME STYLE: HOUSE MEMBERS IN THEIR DISTRICTS* 137 (1978). In our framework, "influence within the House" and "good public policy" are combined in "being a legislator." If the legislator wishes to continue to be a legislator in the future, she will also value reelection.

80. If supporting the instrument is consistent with one's ideological beliefs, then this is a "negative cost," i.e., a benefit.

81. This is also a "negative cost" (benefit) if supporting the instrument is consistent with one's constituents' positions.

82. This includes the use of other resources, but may be thought of as being denominated in units of time.

83. In the face of the overwhelming claims on her time and resources—both in Washington and in her home districts—a member's time and effort carries a significant opportunity cost. See BAUER, *supra* note 76, at 412–13; KINGDON, *supra* note 42, at 216; FENNO, *supra* note 79, at 141. Effort invested in providing support for one bill could have been spent working on other legislation that would satisfy ideological goals, reflect voters' objectives, and/or attract votes, dollars, and other resources; or visiting the home district and supplying constituency services such as help in dealing with the bureaucracy. See

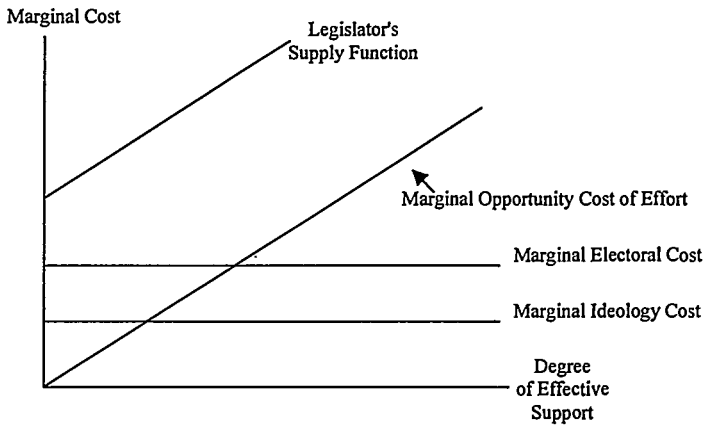


Figure 4
Opportunity Costs and the Supply of Political Support
by an Individual Legislator

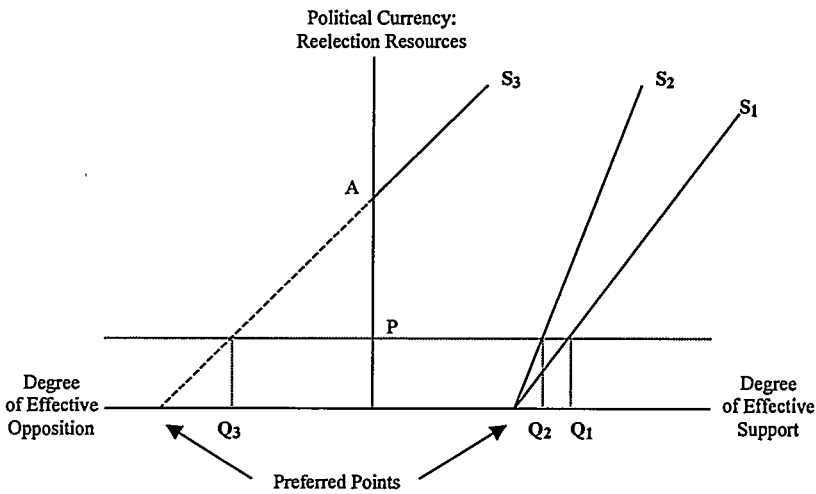


Figure 5
Supplies of Political Support by Individual Legislators

Next, assuming that a legislator derives disutility from acting inconsistently with her ideology, the psychological cost of supporting a policy inconsistent with one's ideological beliefs can be introduced into the framework. 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 4. 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).

Finally, the framework incorporates the third component of the legislator's supply function: the opportunity cost corresponding to the reduced probability of reelection given the support of an instrument not favored by one's electoral constituency. Lost votes from constituents unhappy with the legislator's position would directly affect the legislator's chances of reelection, whereas protest and grassroots efforts by interest groups unhappy with the legislator's position could indirectly affect constituents' assessment of the legislator.⁸⁴ Again, this is a "negative cost" if supporting the instrument is consistent with one's constituents' positions.⁸⁵ As with ideological costs, although these marginal electoral opportunity costs could be increasing or decreasing with the level of the legislator's support, they are drawn as constant (and positive) in Figure 4, to keep things simple.⁸⁶

Accordingly, the overall (individual) marginal cost function, or the legislator's supply-of-support function, is simply the vertical

Denzau & Munger, *supra* note 45, at 92-96; Grier & Munger, *supra* note 45, at 618. Note that the marginal cost function is assumed in the figure to be linear, simply to keep the explication simple.

84. Members of Congress tend to take into account the preferences of the people who voted for them, i.e., their "supporting coalition," see KINGDON, *supra* note 42, at 60, or their "reelection constituency[.]" see FENNO, *supra* note 79, at 8. A conservative legislator whose reelection constituency is anti-regulatory, for example, will not be affected by a minority group of environmentalists calling for command-and-control regulation.

85. Departing from the preferences of constituents reduces the probability of the legislator's reelection. This reduced probability can be evaluated in terms of the resources required to maintain a constant probability of reelection.

86. Figure 4 represents both ideological costs and electoral costs as being positive; support for the policy is essentially inconsistent both with the legislator's own ideology

summation of these three components: opportunity costs of effort, ideological costs, and constituency costs (Figure 4). The amount of support for a policy instrument that a legislator would supply in the absence of any contributions helpful to advancing the member's goals (including her reelection) is represented in Figure 5 as the "preferred point," the intersection of the supply function with the horizontal axis. In this framework, the legislator can be induced to offer progressively greater degrees of support from this preferred point through offers of "political compensation" that offset the legislator's respective opportunity costs.

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_3 , respectively, in Figure 5). A politician who is strongly opposed to a given instrument 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 price⁸⁷ of political compensation is required for any positive degree of support to be forthcoming (see point A in Figure 5).

The 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 in the legislator's district of a new factory that would have to pay pollution taxes) may 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 that 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 reelection campaigns. Moreover, leadership posts in the party offer op-

and her 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 one author, "If your conscience and your district disagree too often, members like to say, 'you're in the wrong business.'" FENNO, *supra* note 79, at 142.

87. The shadow price refers to the implicit price or the marginal valuation of the good or service in question.

portunities for increased effectiveness in the legislature. Obviously, parties are likely to be more generous with legislators who are loyal.⁸⁸

Third, the actions of other legislators will have a bearing on the costs of supplying support thanks to the possibilities for vote trading. For example, one legislator may care a great deal about the chosen level of environmental protection, 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, given her own market-oriented ideology. In a logroll, both legislators could gain from vote trading, with such a logroll affecting 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;⁸⁹ affect a legislator's perceptions of her constituents' policy preferences;⁹⁰ and/or affect a legislator's effort-support production function through provision of information or technical support.⁹¹

D. Formation of Equilibria and Legislative Outcomes

Up to this point, this Article has focused on the origins of supply and demand for a single policy instrument. However, in many contexts, there will be a *set* of possible instruments considered for achieving a given policy goal: for example, a standard, a tax, and a system of tradeable permits. In addition, there will exist the possibility of doing nothing, i.e., maintaining the status quo. Hence if *N* alternative instruments are under consideration, then

88. Party leaders may conceivably also become effective demanders for policy instrument support by offering various resources to legislators in exchange for support, in which case the parties are essentially functioning as interest groups.

89. See KINGDON, *supra* note 42, at 141-42.

90. See David Austen-Smith & John R. Wright, *Counteractive Lobbying*, 38 AM. J. POL. SCI. 25, 29-30 (1994).

91. See BAUER, *supra* note 76, at 354-57.

there will be $N+1$ possible choices of action.⁹² Each option can define a "political market" for effective support.⁹³ On the demand side, each policy instrument may have an associated set of interest groups seeking to secure support for it. Moreover, on the supply side, each policy instrument gives rise to its own set of legislator supply functions.⁹⁴

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.

The following sections examine the component parts of this process. First, the nature of the aggregation of demand for a policy instrument across interested individuals and groups, and the aggregation of supplies of support for a policy instrument across members of the legislature, is considered. Then, the formation of equilibria in the legislature for alternative policy instruments and the consequent choice of political outcome is examined. Finally, alternative approaches to modeling this political market are discussed.

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 the classic model associated with Stigler⁹⁵ and Peltzman,⁹⁶ the "winner takes all": the highest bidder wins and gains control over regulation. In another model, competing interest groups participate in a zero-sum game along a single dimension: one group is taxed, the other subsidized, and each tries to improve

92. The choice set of instruments is simply taken as given. Important questions remain regarding how it is determined, but these are beyond the scope of this Article.

93. An interest group can demand and a legislator can supply support for more than one instrument. Although this may at first seem counterintuitive, recall that each legislator's supply function for a given instrument may include the possibility of opposition.

94. A single legislator may be more efficient at producing support for one instrument than for another and may even have different ideological attitudes towards different instruments. Moreover, the preferences of her reelection constituency may vary across instruments.

95. See Stigler, *supra* note 28, at 12-13.

96. See Peltzman, *supra* note 30, at 212.

its lot at the expense of the other.⁹⁷ In an actual legislature, interest groups may be opposed to one another or aligned in support of the same instrument.

The most obvious approach for aggregating the demand functions of interest groups might be simply to sum, at each level of willingness-to-pay, the degrees of support that 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 vertically summing what each interest group is (marginally) willing to pay for that degree of support. But such an efficient approach is unlikely to reflect positive reality, as long as free-rider problems among interest groups exist. Therefore, the aggregate demand thus calculated represents the upper bound of actual aggregate demand, that is, the demand experienced in the absence of free-riding.

2. Aggregation of Supply of Policy Instrument Options

In this framework, the degree of support by individual legislators is denominated in terms of homogenous units of "effective support," with differences among legislators already incorporated into the underlying production functions with respect to individual marginal opportunity costs of effort (as well as individual marginal ideological and electoral costs). Therefore, the legislature's supply function can be derived by horizontally summing 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_3 in Figure 5), 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 supply function for some instruments may intersect the vertical axis at a positive price.

97. See Becker, *supra* note 31, at 373-76.

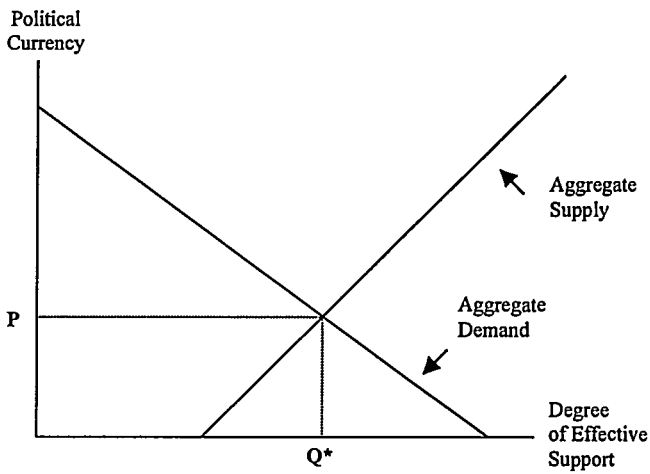


Figure 6
 Aggregate Demand and Aggregate Supply of Political Support
 and the Formation of a Legislative Equilibrium

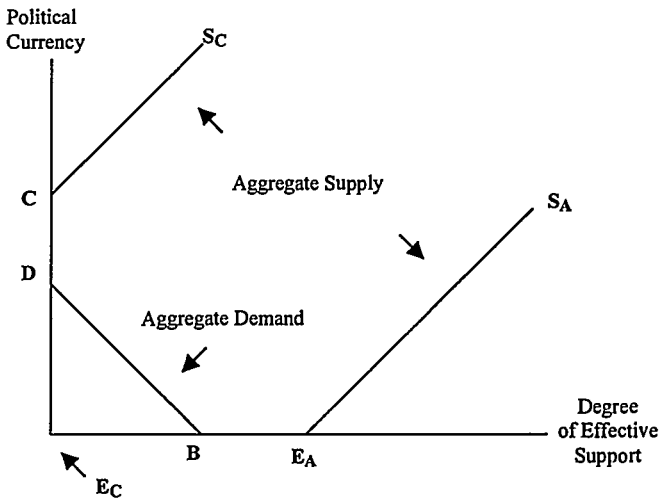


Figure 7
 Degenerate Cases in the Political Market

3. *Equilibrium Support in the Legislature for a Policy Instrument*

The model treats the legislature as a competitive market for the support of policy instruments. Given the homogeneity of the commodity demanded and supplied, the number of members in the two houses of Congress, and the number of active interest groups, perfect competition is a reasonable first approximation. Under that assumption, the equilibrium, aggregate level of "effective support" provided for the policy instrument is the level for which aggregate supply equals aggregate demand (Q^* in Figure 6). This level is associated with a shadow price (P in Figure 6) representing the aggregate marginal willingness to pay for support in the legislature's equilibrium.

There are two cases of interest in which the aggregate supply and demand functions do not intersect in the politically relevant positive orthant, the northeast part of the graph where both price and quantity are positive. In one case, 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_A in Figure 7). In that instance, the maximum support demanded in aggregate by interest groups (at zero price) is lower than the amount that the legislature would provide on its own. In this case of "excess supply," it is reasonable to assume that the legislature would provide support at its preferred point (E_A). With the likelihood of free-riding among interest groups, it would not be surprising if the aggregate demand by interest groups often fell short of the support a strongly committed legislature would provide absent any lobbying. In the above case, the competitive equilibrium price is zero, with each legislator providing support at her own preferred point.

A second special case arises when a legislature so strongly opposes a policy that its upward-sloping aggregate supply function intersects the vertical axis at a positive price (point C in Figure 7). In this case, the supply function could conceivably lie entirely above the interest groups' aggregate demand function. The political price that such a legislature would require for a positive degree of support is simply greater than the interest groups' overall reservation price for obtaining such support (point D in Figure 7).

In this competitive political market framework, an individual legislator will tend to supply support for a particular policy instrument up to the point where her marginal opportunity costs of doing

so are equivalent to the infinitely elastic demand for support she faces from interest groups, represented by the horizontal line through the point P in Figure 5 (derived from the equilibrium in Figure 6). Thus, a set of legislators with supply functions represented by S_1 , S_2 , and S_3 (Figure 5), would provide effective support of Q_1 , Q_2 , and Q_3 , respectively.

The legislator with supply function S_3 provides a negative level of support, i.e., opposition. An interest group might benefit from contributing to this legislator in the hope of reducing her degree of active opposition,⁹⁸ 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 to move this same legislator to a position of inaction or indifference. On the other hand, legislators such as those represented by S_1 and S_2 in Figure 5 derive benefits (negative costs) from supporting an instrument, no matter what the position of relevant interest groups. Not surprisingly, such friendly legislators supply even greater levels of support in response to interest group demand.

4. Legislative Outcomes

The previous section discussed the equilibrium level of support for a policy instrument by a single legislator. The next step, then, is to ask how these individual levels of support translate into policy outcomes. One could imagine summing the individual levels of support across legislators to find the aggregate support for an instrument. Such an approach is insufficient, however, because it ignores institutional processes (for example, various kinds of voting rules) that influence collective decisions. In moving from individual support to policy outcomes, therefore, the analysis must take institutional features of the legislature into account.

First, the committee structure of Congress (especially in the House of Representatives) gives different legislators widely different levels of influence over policy.⁹⁹ Thus, legislators vary greatly

98. Hall and Wayman examine legislator participation in committees, and argue that interest groups give contributions to "hostile" legislators in order to reduce their participation, i.e., their opposition. See Hall & Wayman, *supra* note 61, at 803.

99. Norms of deference, backed up by repeated interactions and the threat of retaliation, give members of committees and subcommittees significant influence over policies under their jurisdiction. See Shepsle & Weingast, *supra* note 61, at 88-89;

in the effectiveness of the support they can supply for a given instrument. However, with the framework's 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.¹⁰⁰ Furthermore, the order of voting on amendments and the nature of the final vote also affect the outcome.¹⁰¹ The question is then how support translates into votes. Whereas the model's "degree of support" is a continuous variable, it produces a binary variable: a vote. Any empirical implementation of this framework would need to address this linkage.¹⁰² For the purposes of this Article, focus can be confined to the reality that, in general, the policy instrument chosen will be the alternative garnering the greatest aggregate support.

5. *Alternative Equilibrium Frameworks*

Alternative conceptual frameworks of the political market are possible. One potential approach would give greater emphasis to the differences existing among individual legislators in terms of

Weingast & Marshall, *supra* note 61, at 158. Agenda-setting or "gate keeping" powers give committees the right to send bills to the floor or table them in committee. Standing committees are also heavily represented on the conference committees that are established to reconcile differences between the chambers before final passage. Power is particularly concentrated in the hands of committee chairs, who hold sway over the committees' agendas and the bills reported to the floor. Given the importance of committee composition, policy outcomes may differ markedly from the preferences of the legislature as a whole; given low committee turnover and the importance of seniority, the status quo may persist long after support in the full legislature has ebbed. See Kenneth A. Shepsle & Barry R. Weingast, *Political Solutions to Market Problems*, 78 AM. POL. SCI. REV. 417, 429 (1984).

100. In the U.S. Congress, a bill needs a bare majority in the House of Representatives, but may have to clear a higher hurdle in the Senate to bring closure to debate. If the President vetoes the bill, of course, two-thirds majorities in both houses are required to enact legislation.

101. If modified by successful amendments, a bill will be considered in opposition to the status quo in the final vote. This arrangement favors the status quo and requires that each bill be compared ultimately with the status quo rather than with other alternatives.

102. Discrete-choice econometric models theoretically based on the existence of an unobserved latent variable are obvious candidates.

the nature of support they can provide. Thus, instead of quantifying support in terms of perfectly homogenous units of "effective support," the "uniqueness" of support from any single legislator (particularly from powerful members of the legislature) would be interpreted as leading to a set of monopoly political markets, rather than to a single competitive political market.

At one extreme, each member of the legislature is assumed to be a monopoly supplier of her unique type of support and is thus facing a downward-sloping demand for her support. As such, there would exist a set of monopoly equilibria, one for each member of the legislature. In their respective equilibria, each member equates her marginal cost (individual supply function) with the "marginal revenue" function associated with the policy demands she faces, and determines her equilibrium (and utility-maximizing) level of support.

The extreme case of multiple monopoly suppliers appears less reasonable than the perfectly competitive case as an approximation of political reality. However, it does illustrate the potential for alternative models of imperfect competition that may be superior for capturing important characteristics of political markets. Various models of cooperative and noncooperative oligopoly might capture significant elements of legislative relationships.¹⁰³ Such explorations will not be dealt with here. Instead, in order to develop a conceptual framework within which existing political economy theories can be organized and synthesized, the basic competitive framework is examined further.

IV. 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, labor, and consumers.

103. For example, the respective roles played by committee chairs and members may be modeled as a monopolist operating in the context of a competitive fringe.

A. Firms

Firms tend to demand the policy instruments promising the highest profits (or the lowest 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 particular instruments given lower aggregate costs of compliance compared to the industry as a whole; the presence of rents and entry barriers; and differential costs of compliance across firms in a given industry.¹⁰⁴

1. Lower Aggregate Costs to an Industry as a Whole

All else being equal, firms will tend to prefer regulatory instruments with lower aggregate costs for the industry as a whole. As market-based approaches are likely more cost-effective than command-and-control instruments, the above would suggest that private industry as a whole would generally prefer market-based approaches. However, a crucial distinction exists between the aggregate cost for society and the aggregate cost for private industry. By definition, cost-effective instruments minimize costs to society; they may however vary in proportion of costs imposed on polluters. Accordingly, the use of market-based instruments does not guarantee that firms' compliance costs will be less than the compliance costs of command-and-control regulation.

104. There are other plausible explanations for firms' preferences. Firms may simply support the continuation of the status quo, which is generally the command-and-control approach, because replacing familiar policies with new instruments can mean that existing expertise within firms becomes less valued. See STEVEN P. KELMAN, *WHAT PRICE INCENTIVES?* 118-22 (1981); Stewart, *supra* note 16, at 40. For example, lobbyists—the agents in a principal-agent relationship—may be rationally expected to resist the dissipation of their human capital. See Robert W. Hahn & Robert N. Stavins, *Incentive-based Environmental Regulation: A New Era from an Old Idea*, 18 *ECOLOGY L.Q.* 1, 24 (1991). It has also been suggested that market-based instruments may be opposed simply because they are not well understood, and there is at least anecdotal evidence that this has been the case. See KELMAN at 96, above; W.P. Welch, *The Political Feasibility of Full Ownership Property Rights: The Case of Pollution and Fisheries*, 16 *POL'Y SCI.* 165, 175 (1983). Such lack of understanding can also affect the supply side, and we discuss this later.

It would then follow that firms would oppose regulatory instruments that shift a greater cost burden onto industry. For instance, the virtually unanimous opposition by private industry to pollution taxes results from 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 any residual emissions.¹⁰⁵ Similarly, under tradeable permit schemes, firms bear equivalent costs if the initial distribution of the permits is through an auction. In contrast, under a tradeable permit scheme with grandfathered permits, existing firms do not bear any cost for their residual emissions.¹⁰⁶

The above suggests that private industry as a whole would prefer grandfathered permits *and* standards to other instruments, since grandfathered permits are cost-effective and the burden placed on industry (at least on existing firms) is minimized. Emissions standards are usually worse for industry in terms of the total-cost criterion, but are likely to be preferred by firms to auctioned permits or taxes.

2. Generation of Rents and Erection of Entry Barriers

Certain types of regulations can actually augment firms' profits through the generation of rents and the erection of entry barriers. In general, firms earn rents if a regulatory instrument drives price above average cost. Assume the case of a command-and-control standard that sets an allowable level of aggregate pollution for each firm, where firms can meet the standard only by reducing output.¹⁰⁷ Assume further that the industry is initially made up of many identical firms, each facing an identical demand, with classical

105. On this point, see KELMAN, *supra* note 104, at 120; see also FRANK S. ARNOLD, *ECONOMIC ANALYSIS OF ENVIRONMENTAL POLICY AND REGULATION* 227 (1995); ROBERT W. CRANDALL, *CONTROLLING INDUSTRIAL POLLUTION* 70 (1983); Robert W. Hahn & Roger G. Noll, *Environmental Markets in the Year 2000*, 3 J. RISK UNCERTAINTY 351, 359 (1990). Actually, firms pay less than the full amount of the tax, since a share is passed on to consumers.

106. Grandfathering distributes the rents from permits to firms that participate in the initial allocation, in contrast with an auction. See Donald N. Dewees, *Instrument Choice in Environmental Policy*, 21 *ECON. INQUIRY* 53, 59 (1983); Gary W. Yohe, *Polluters' Profits and Political Response: Direct Control Versus Taxes: Comment*, 66 *AM. ECON. REV.* 981, 981 (1976).

107. See James M. Buchanan & Gordon Tullock, *Polluters' Profits and Political Response: Direct Control Versus Taxes*, 65 *AM. ECON. REV.* 139, 140 (1975).

average and marginal cost functions. In the absence of regulation, each firm would produce at the intersection of its marginal and average cost curves, making zero profits. The environmental standard reduces total production and therefore raises price along the aggregate demand curve. If the environmental restriction is not exceptionally severe, the new price will be above average cost for all firms. Firms, therefore, earn rent: the difference between the price they receive for their product and their cost of production. If entry is prohibited, existing firms will continue earning rents into the future; even if not, rents will last until enough new firms enter to reestablish competitive equilibrium at the new price. Hence, in the above model, firms may prefer standards to no regulation at all, and firms will prefer standards to taxes, since a tax charges for a resource that otherwise would be free.¹⁰⁸

Firms, however, are not limited to the single response of cutting output. They can also reduce emissions by adopting new technologies or by 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.¹⁰⁹ Here, too, under certain conditions, firms may prefer command-and-control standards to no regulation at all.¹¹⁰

It is important to note that the enhanced industry profitability resulting 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

108. Even if the restriction is severe enough to impose losses on firms, they will prefer standards to taxes, which impose new costs. In the long run, under a tax scheme, firms will exit the industry until a new zero-profit equilibrium is reached; in the short term, firms will lose money. The tax reduces each firm's present value of income, whether it remains in the industry or exits. Firms will therefore oppose the introduction of pollution taxes.

109. See Michael T. Maloney & Robert E. McCormick, *A Positive Theory of Environmental Quality Regulation*, 25 J.L. & Econ. 99, 105 (1982).

110. Pollution restrictions raise both the average and marginal cost curves. Each firm will produce at the level where restricted marginal cost intersects the per-firm demand curve. If the minimum average cost under regulation is to the left of this point, the price (marginal cost) will exceed average cost, and firms will earn rents. Maloney and McCormick identified three conditions that are sufficient for regulation to enhance producer profits: (1) output under regulation corresponds to some cost-minimizing level of output in the absence of regulation; (2) pollution increases with output; and (3) average costs increase more at higher levels of output under regulation. See *id.* at 104. The necessary and sufficient condition for higher profits is that the intersection of average and marginal cost under regulation lie to the left of the firm's demand curve.

benefit if that instrument is linked to a mechanism that imposes barriers to entry. In theory, such a mechanism might prohibit new entry outright; a more politically feasible approach would impose higher costs on new entrants.¹¹¹

The above body of theory explains why private firms (and their trade associations) may have a strong preference for command-and-control standards, which may create rents, and especially for considerably more stringent command-and-control standards for new pollution sources, which create barriers to entry.¹¹² The indication that firms would support this form of regulation begins to explain the prevalence of such instruments in U.S. environmental law. Furthermore, the theory indicates that, under certain conditions, the regulated industry would be better off than without 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 regulatory instruments (such as analyses of resources devoted to lobbying for such instruments as a function of firms' stakes in an issue) are virtually nonexistent. Instead, most empirical work in this area simply seeks to measure the benefits an industry receives under regulation. Thus, the work examines not instrument demand itself, but rather the presumed product of such demand.¹¹³

The above discussion also provides a positive political economy explanation for why market-based instruments have virtually

111. See Stigler, *supra* note 28, at 3, 5; Eric Rasmusen & Mark Zupan, *Extending the Economic Theory of Regulation to the Form of Policy*, 72 *PUB. CHOICE* 167, 187-89 (1991).

112. Other barriers to entry result, for example, from the permitting requirements for new sources under the PSD and non-attainment programs under the Clean Air Act, as well as by non-attainment programs' offset requirements for new sources. The positive significance of scarcity rents as a major explanation for the prevalence of particular forms of environmental regulation has important normative implications as well. This is because, in the presence of pre-existing tax distortions, the distribution of these rents can have efficiency implications. See Fullerton & Metcalf, *supra* note 19, at 44-45. It is ironic that the mechanism that facilitates political acceptance of some environmental policies (transmission of scarcity rents to the regulated sector) may also undo some or all of the welfare gains that would have been forthcoming.

113. Several researchers employed financial market event analysis in two regulatory cases to test whether the value of regulated firms (measured by stock market prices) was positively affected by the announcement of regulation, as the economic theory of regulation would suggest. They found that cotton dust standards promulgated by the U.S. Occupational, Safety, and Health Administration ("OSHA") raised the asset value of cotton producers, which is consistent with the notion that regulation increased firms' profits by

always taken the form of grandfathered tradeable permits, or at least why private firms should be expected to have strong demands for this means of permit allocation. In tradeable permit schemes, grandfathering not only conveys scarcity rents to firms, since existing polluters are granted valuable economic resources for free, but also provides entry barriers, in that new entrants must purchase permits from existing holders.¹¹⁴

The preceding discussion does not provide a compelling explanation for the prevalence of command-and-control standards over grandfathered tradeable permits. In principle, either instrument could provide sustainable rents to existing firms. The theory needs to be extended to explain this phenomenon.

3. Differential Costs across Firms in an Industry

An alternate explanation for the landscape of environmental policy instruments arises from the existence of differential costs of environmental compliance across firms. Due to 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, giving it a competitive advantage.¹¹⁵ For example, firms which could reduce lead content at relatively low costs (thanks to large refineries) tended to support the tradeable permit system by which the leaded content of gasoline was reduced in the 1980s,¹¹⁶ while firms with less efficient, smaller refineries were vehemently opposed.¹¹⁷ Other

creating rents. See Maloney & McCormick, *supra* note 109, at 122. However, a more comprehensive study reached the opposite conclusion. See John S. Hughes et al., *The Economic Consequences of the OSHA Cotton Dust Standards: An Analysis of Stock Market Price Behavior*, 29 J.L. ECON. 29, 58-59 (1986).

114. One research group provided anecdotal evidence for rent-seeking in the decision making process over EPA's implementation of the Montreal Protocol restricting the use and production of CFCs. See Hahn & McGartland, *supra* note 19, at 601-10. They argue that a rent-seeking model explains the positions of large producers supporting grandfathered tradeable permits and opposing other implementation schemes, including an auction proposal. See *id.*

115. See ROBERT A. LEONE & JOHN E. JACKSON, *STUDIES IN PUBLIC REGULATION* 231, 247 (Gary Fromm ed. 1981); Sharon Oster, *The Strategic Use of Regulatory Investment by Industry Sub-groups*, 20 ECON. INQUIRY 604, 606 (1982).

116. See KERR & MARÉ, *supra* note 24, at 31.

117. See *Small Refiner Lead Phasedown Task Force v. EPA*, 705 F.2d 506, 514 (D.C. Cir. 1983) (discussing small refineries' opposition). Another example of such intra-industry differentials, and the resulting splintering of lobbying strategy, occurred when the National Coal Association ("NCA") divided over the question of scrubber requirements in clean air legislation. A universal scrubber requirement would have preserved demand for eastern

empirical work, however, has cast doubt on the proposition that firms advocate instruments based on inter-industry or intra-industry transfers.¹¹⁸

Another form of cost differential arises as a result of barriers to entry. It is important to maintain the distinction between the entry of new firms and the expansion of existing firms. Entry barriers from environmental regulation generally apply to both situations. Within an industry, firms with no plans to expand would derive greater benefit from entry barriers, potentially discouraging further growth by their competitors.

Conversely, firms with ambitious expansion plans relative to their existing operations would benefit from weaker barriers. Such firms would also try to structure barriers in a manner giving them an advantage relative to newcomers. For example, the "bubble" program of the Clean Air Act creates barriers that are less onerous for existing firms because firms are allowed to engage in intra-firm emissions trading.¹¹⁹ 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.¹²⁰ The CAA's banking policies, which allow intra-firm trading across time periods, also make expansion by an incumbent easier than entry by a new firm.

coal, which had higher sulfur content than its cleaner western competition. The NCA split between eastern and western coal producers and stayed out of the debates leading up to the 1977 Clean Air Act Amendments. See BRUCE A. ACKERMAN & WILLIAM T. HASSLER, *CLEAN COAL/DIRTY AIR* 31 (1981). Similarly, the largest producers of CFCs (DuPont and Imperial Chemical Industries) supported a ban on CFCs mainly because they were the firms best able to develop substitutes. See Kenneth A. Oye & James H. Maxwell, *Self-Interest and Environmental Management*, in *LOCAL COMMONS AND GLOBAL INTERDEPENDENCE: HETEROGENEITY AND COOPERATION IN TWO DOMAINS* 191, 198 (Robert O. Keohane & Elinor Ostrom eds., 1995).

118. Several researchers found that legislators with a paper producer in their districts voted against water pollution control legislation, regardless of whether the producer stood to gain or lose relative to its competitors. See LEONE & JACKSON, *supra* note 115, at 247. These authors note that firms may oppose regulation out of uncertainty concerning how the legislation will be implemented, since cost predictions depend on subsequent rulemaking decisions by administrative agencies. *Id.* at 248.

119. See 51 Fed. Reg. 43,814, 43,830 (1986). The bubble program typically permits only geographically contiguous trades. Thus, even among existing firms with expansion plans, the benefits of the program depend on where the expansion is contemplated.

120. Inter-firm trading (as opposed to only intra-firm trading) would eliminate this advantage. See 51 Fed. Reg. 43,814, 43,847-48 (1986).

The mechanism for allocating tradeable permits might also produce different winners and losers within an industry. Under a grandfathering scheme that allocates permits on the basis of emissions at the time of the scheme's establishment, firms investing in pollution abatement prior to regulation stand to lose relative to their more heavily polluting competitors.¹²¹ Although such investing and expanding firms might conceivably prefer the allocation of permits by means of an initial auction,¹²² smaller firms often prefer grandfathering out of concern that auctions will be dominated by larger players.¹²³

B. Environmental Organizations

As noted above, the utility of an environmental advocacy group will probably 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 by several factors, all else being equal:

121. See Hahn & Noll, *supra* note 105, at 359.

122. Some supporting evidence is provided by the establishment of a market in takeoff and landing slots at the nation's busiest airports. Since 1968, peak-hour takeoffs and landings have been restricted at LaGuardia, John F. Kennedy, O'Hare, and Washington National Airports. Until 1986, these slots were allocated by a scheduling committee composed of the airlines using a given airport. In that year, the Federal Aviation Administration ("FAA") replaced the committee allocation system with a system of grandfathered tradeable permits. See *Government Policies on the Transfer of Operating Rights Granted by the Federal Government: Hearings before the Subcomm. on Aviation of the House Comm. on Pub. Works and Transp.*, 99th Cong. 2-4 (1985) (statement of Rep. Norman Y. Mineta). In the months before the proposal was to go into effect, Congress held hearings and considered whether to overrule the FAA. At the hearings, large airlines, which already held most of the slots, supported grandfathering. See, e.g., *id.* at 55-56 (statement of Robert L. Crandall, CEO, American Airlines); *id.* at 96 (statement of Steven G. Rothmeier, CEO, Northwest Airlines). In contrast, upstart airlines looking to expand but having few slots, such as People Express, Republic, and Western, vigorously opposed grandfathering, calling for a large percentage of existing slots to be auctioned or distributed by lottery. See, e.g., *id.* at 71 (statement of Robert E. Cohn, CEO, People Express); *id.* at 372 (statement of A.B. Magary, Marketing VP, Republic Airlines).

123. See Hahn & McGartland, *supra* note 19, at 606. Similarly, since the transition to a grandfathered-permits system is likely to involve less uncertainty than an auction, it might receive disproportionate support from risk-averse firms. *Id.* at 605.

the likelihood that the instrument will be chosen by policymakers;¹²⁴ the degree to which the organization is clearly identified with supporting the instrument; the magnitude of potential funding gains from distinguishing the organization from other environmental groups; and the ability to offer donors and members a compelling environmental quality argument 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 predispositions to the use of market-based approaches, the proposal had a strong chance of success. 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 tradeable 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.¹²⁵

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. Because of their interest in strengthening environmental protection, environmental organizations might be expected to prefer command-and-control approaches to market-based schemes for philosophical, strategic, and technical reasons. On philosophical grounds, environmentalists

124. There is an important distinction between advocacy groups' strategic and tactical decisions. An environmental organization's strategic decision to express demand for a policy instrument and get it on the agenda for consideration tends to be positively related to perceived probability of success, whereas the tactical decision to express demand for an instrument already on the agenda may well be negatively related to probability of success.

125. See Hahn & Stavins, *supra* note 104, at 33 n.180.

have portrayed pollution taxes and tradeable permits as “license[s] to pollute[.]”¹²⁶ Moreover, they have voiced concerns that damages from pollution—to human health and to ecological well-being—are so difficult or impossible to quantify and monetize that the harm cannot be calculated through a marginal damage function or captured by a Pigouvian tax rate.¹²⁷

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 “takings” claims and demands for government compensation.¹²⁸ 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,¹²⁹ 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 efforts 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 environmentalists’ opposition 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.¹³⁰

Third, environmental organizations may object to decentralized instruments on technical grounds. Although market-based in-

126. See KELMAN, *supra* note 104, at 44. This criticism overlooks the fact that under conventional command-and-control regulations, firms receive these same licenses to pollute for free. See Hahn & Stavins, *supra* note 104, at 37.

127. See KELMAN, *supra* note 104, at 54–55.

128. See Hahn & Noll, *supra* note 105, at 359.

129. See 42 U.S.C. § 7651b(f) (1994).

130. See KELMAN, *supra* note 104, at 139–42. Note that these strategic arguments refer, for the most part, to pollution taxes, not to market-based instruments in general.

struments are theoretically superior in terms of cost-effectiveness, problems may arise in translating theory into practice.¹³¹ For example, an emission tax or tradeable permit scheme can lead to localized "hot spots" with relatively high levels of ambient pollution.¹³² While this problem can be addressed in theory through the use of permits or charge systems that are denominated in units of environmental degradation, the design of such systems might be perceived as excessively cumbersome.¹³³

C. Labor

Since unions generally seek to protect jobs, they might be expected to oppose instruments likely to lead to plant closings or other large industrial dislocations. Under a tradeable permit scheme, for example, firms might close their factories in heavily polluted areas, sell permits, and relocate to less polluted areas, where permits are less expensive.¹³⁴ 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 PSD policy in clean air regulation, which has discouraged movement of industry out of urban areas in the northeast into high-quality air sheds in the South and West.¹³⁵ Depending on the tradeoffs between job creation and preservation effects, labor might support stricter command-and-control standards for new sources.¹³⁶

Indeed, one reason environmental groups such as EDF have endorsed the tradeable permits approach is that it promises the cost savings of taxes without the drawbacks that environmentalists associate with tax instruments.

131. See Robert W. Hahn & Robert L. Axtell, *Reevaluating the Relationship Between Transferable Property Rights and Command-and-Control Regulation*, 8 J. REG. ECON. 125, 126-27 (1995).

132. See Richard L. Revesz, *Federalism and Interstate Environmental Externalities*, 144 U. PA. L. REV. 2341, 2412 (1996).

133. See *id.* at 2412-14.

134. See Hahn & Noll, *supra* note 105, at 358.

135. See, e.g., CRANDALL, *supra* note 105, at 127-29 (1983); B. Peter Pashigan, *Environmental Regulation: Whose Self-Interests Are Being Protected?*, 23 ECON. INQUIRY 551, 552-53 (1985).

136. 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. See ACKERMAN & HASSLER, *supra* note 117, at

D. Consumers

To the extent that consumer groups have preferences among environmental policy instruments, one might expect them to favor those instruments that minimize any increases in the prices of consumer goods and services; this would seem to suggest cost-effective (hence, market-based) instruments over command-and-control.¹³⁷ In practice, however, these groups typically have not expressed strong demand for environmental policies. As mentioned above, free-riding and limited information are likely to present greater obstacles for consumer organizations than for environmental groups, especially on environmental issues. Thus demand from consumer groups for environmental policy instruments is likely to be muted. Moreover, environmental policy may lie outside the core concerns of consumer groups' constituents. Indeed, when consumer groups do get involved, it may be on "consumer health and safety" issues, where their interests are aligned with those of environmentalists. Calls for cost-effective policies might also be voiced by taxpayer organizations, but again, the minutiae of instrument choice lie outside the scope of these groups' primary concerns. Hence, environmental groups are unlikely to face significant opposition from other public interest organizations.

V. 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-

31. Likewise, in the debates over the SO₂ allowance trading system in the 1990 amendments to the CAA, 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 over high-sulfur coal from eastern, unionized mines. See *Clean Air Reauthorization: Hearing Before the Subcomm. on Energy and Power of the House Comm. on Energy and Commerce*, 101st Cong. 455-56 (1989) (statement of Richard L. Trumka, President, United Mine Workers).

137. It is also possible to distinguish among types of market-based instruments and types of command-and-control instruments, given that any environmental policy instrument that generates privately retained scarcity rents (such as new source performance standards, grandfathered tradeable permits, and others) also raises consumer prices, relative to a policy that does not generate such rents. See Fullerton & Metcalf, *supra* note 19, at 44.

control approaches to regulation.¹³⁸ Similarly, legislators may need to spend time learning about unfamiliar policy instruments 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.¹³⁹ 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.¹⁴⁰

Second, ideology plays a significant role in instrument choice. A conservative lawmaker who generally supports the free market might be predisposed to support market-based instruments; a legislator with more faith in government and less faith in the private sector might, all else being equal, prefer a command-and-control approach. A 1981 survey of congressional staff members found that support and opposition to effluent charges was based largely on ideological grounds.¹⁴¹ For example, Republicans who supported the concept of pollution charges offered assertions such as "I trust the marketplace more" or "less bureaucracy" is desirable, without any real awareness or understanding of the economic arguments for market-based programs.¹⁴² Likewise, Democratic opposition was

138. See ALLEN V. KNEESE & CHARLES L. SCHULZE, POLLUTION, PRICES, AND PUBLIC POLICY 116-17 (1975).

139. See *id.* at 114-15. This argument assumes that a legislator (or at least her staff) needs to understand an instrument in order to support it. Although such understanding might not be a precondition for voting in favor of the instrument, it is more important for other forms of support, such as insertion of a statement into the legislative history, efforts to get a bill through committee, or attempts to persuade other legislators. Moreover, a lack of understanding may hurt the legislator in her reelection campaign if the press or an opponent seeks to make it an issue. Thus, the greater the prominence of an issue, the more important it will be for a legislator to have a compelling rationale for her position. Responding to this need, interest groups may supply legislators with justifications for supporting given policies. See, e.g., FENNO, *supra* note 79, at 141-43; KINGDON, *supra* note 42, at 46-48.

140. See Hahn & Stavins, *supra* note 104, at 31, 36. Thus, outreach efforts by economists and others may be thought to have both demand-side and supply-side effects. On the demand side, increased understanding of market-based instruments may have increased the demand for these instruments by various interest groups. On the supply side, increased understanding reduces learning costs for legislators. Since both effects translate into rightward shifts of the respective functions, the outcome is unambiguous in terms of increased degrees of support.

Economists have also played a sometimes significant role as advocates of market-based instruments on efficiency grounds, not only in aspects of environmental policy (such as the U.S. acid rain program) but also in other policy areas, such as the allocation of airport landing spots and the broadcast spectrum. Economists therefore might be seen as acting as "policy entrepreneurs" outside of the interest group-politician nexus (i.e., outside of the strict supply-and-demand framework posited here). See *id.* at 41.

141. See KELMAN, *supra* note 104, at 100.

142. See *id.* at 100, 104.

largely based upon analogously ideological factors, with little or no apparent understanding of the real advantages or disadvantages of the various instruments.¹⁴³

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.¹⁴⁴ 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. The importance of perceived costs and benefits is a consequence of the limited information most voters have about the details of public policy.¹⁴⁵ 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.¹⁴⁶ In contrast, though they impose lower total costs, market-based instruments generally impose those costs directly, in the form of effluent or permit charges.¹⁴⁷ Grandfathered permits fare better on the visibility criterion than auctioned permits or taxes, because no money is exchanged at the time of the initial allocation.¹⁴⁸

143. See *id.* at 100–01.

144. See, e.g., Matthew D. McCubbins & Terry Sullivan, *Constituency Influences on Legislative Policy Choice*, 18 *QUANTITY & QUALITY* 299, 301–02 (1984); Robert W. Hahn, *Jobs and Environmental Quality: Some Implications for Instrument Choice*, 20 *POL'Y SCI.* 289, 299 (1987).

145. A rational voter will choose to remain ignorant on most issues, because the costs of gathering information are likely to outweigh the nearly insignificant benefits from voting knowledgeable. See ANTHONY DOWNS, *AN ECONOMIC THEORY OF DEMOCRACY* 212–13 (1957). In contrast, organized interest groups with large stakes in an issue are likely to be well-informed and thus overrepresented in the political process. These issues raised by asymmetric information are particularly relevant to instrument choice, because votes on instrument choice are often much more technical than votes on policy goals, and therefore attract even less attention from average voters. See generally James T. Hamilton, *Taxes, Torts, and the Toxics Release Inventory: Congressional Voting on Instruments to Control Pollution*, 35 *ECON. INQUIRY* 745 (1997).

146. See McCubbins & Sullivan, *supra* note 144, at 306. The point that politicians prefer, all else being equal, regulatory instruments with “invisible” associated costs is related to the more general notion that legislators may seek to disguise transfers to special interests. See Stephen Coate & Stephen Morris, *On the Form of Transfers to Special Interests*, 103 *J. POL. ECON.* 1210, 1212 (1995).

147. The potential government revenue offered by auctions and taxes is likely to be politically attractive. See Hahn & McGartland, *supra* note 19, at 608–09.

148. One commentator emphasized the importance of observable costs and benefits in explaining why Wisconsin chose a largely state-funded pollution-credit program over an effluent charge. See Hahn, *supra* note 144, at 299. The instrument offered visible job creation, by favoring the construction of new facilities, at the expense of diffuse, less visible costs to widely distributed third parties. In contrast, the market-based alternative would have appeared to sacrifice jobs while its cost-saving benefits would have been less evident. See *id.* at 299–300.

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, as strong statements of support for environmental protection, can be readily combined with less visible exemptions.¹⁴⁹ Congress has on several occasions passed environmental laws with strict compliance standards, while simultaneously including lax or insufficient enforcement measures.¹⁵⁰ Tradeable permits and taxes do not offer the powerful symbolic benefits of declaring strict standards. Moreover, it may be difficult to have market-based instruments which simultaneously "exempt" certain parties or which are "loosely" enforced.¹⁵¹

Fifth, if politicians are risk averse, they will prefer instruments involving more certain effects.¹⁵² With respect to 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.¹⁵³ Typically, legislators are more concerned with the distribution of costs and benefits than with a comparison of total benefits and costs.¹⁵⁴ 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

149. See Hahn & Noll, *supra* note 105, at 361. Of course, the reliance on voter ignorance may be countered by better informed interest groups.

150. See *id.*

151. But see Joskow & Schmalensee, *supra* note 21 (examining Congressional attempts to confer benefits on particular firms within the context of the SO₂ allowance trading program).

152. See Matthew D. McCubbins et al., *Structure and Process, Politics and Policy: Administrative Arrangements and the Political Control of Agencies*, 75 VA. L. REV. 431, 437 n.22 (1989) ("Legislators are likely to behave as if they are risk averse, even if they are personally risk neutral, if their constituents punish unpredictable policy choices or their reelection probability is nearly unity").

153. See Matthew D. McCubbins & Talbot Page, *The Congressional Foundations of Agency Performance*, 51 PUB. CHOICE 173, 178 (1986).

154. See Hahn & Stavins, *supra* note 104, at 38-41.

politician is getting the best deal possible for her constituents.¹⁵⁵ Moreover, politicians are likely to oppose instruments (such as tradeable permit schemes) that may induce firms to close business and relocate elsewhere, leading to localized unemployment.¹⁵⁶ 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.¹⁵⁷

Sixth, command-and-control instruments offer Congress greater control with respect to the implementation of legislative outcomes by administrative agencies. To ensure that the interests of the winning coalition are protected in implementation, Congress may effectively prescribe administrative rules and procedures that favor one group over another.¹⁵⁸ In theory, such a practice protects intended beneficiaries of legislation by constraining the scope of subsequent executive intervention in implementation.¹⁵⁹ If stacking the deck is an important aspect of policymaking, 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

155. See Kenneth A. Shepsle & Barry Weingast, *Political Solutions to Market Problems*, 78 AM. POL. SCI. REV. 417, 418–20 (1984).

156. See Hahn & Noll, *supra* note 105, at 358. Tradeable permits are more likely to be adopted in cases where the industry to be regulated is relatively dispersed and has relatively homogeneous abatement costs. See *id.* at 363–64. But such homogeneity also means that the gains from a market-based approach are more limited.

157. The Clean Air Act Amendments of 1977 provide an example of legislation built upon such compromises. See *id.* at 361–62. Stringent standards for urban non-attainment areas were offset by industry-specific exemptions and by measures preventing relocation of urban factories to less polluted areas, the so-called PSD policy described above. See *id.* at 361. The winning coalition would likely not have held up under a tradeable permit scheme, which would have allowed rust belt firms to purchase pollution permits from firms in cleaner areas and thus to relocate. See *id.* On the other hand, a tradeable permit scheme that prevented interregional trading could presumably have protected northern factory jobs just as well.

For the same reason, grandfathering of tradeable 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. Several prominent researchers have examined the political process of allocating SO₂ emissions permits in the 1990 amendments to the Clean Air Act. See Joskow & Schmalensee, *supra* note 21. Their focus was on empirically measuring the role of interest group politics and rent-seeking in how those permits were allocated, but another point is made clear by their work: allocating permits by grandfathering can produce fairly clear “winners” and “losers” among firms and states. See *id.* An auction, on the other hand, would allow no such political maneuvering.

158. See McCubbins et al., *supra* note 152, at 244.

159. See *id.* at 261–62.

up to the market, treating polluters identically.¹⁶⁰ Standards, on the other hand, open up possibilities for stacking the deck, by building protections in favor of particular constituencies.¹⁶¹ For example, Congress might favor industry by placing the burden of proof in standard-setting on the administrative agencies, or alternatively help out environmental groups by including citizen-suit provisions allowing legal action to impel standards enforcement.

Seventh, bureaucrats are less likely to undermine the legislative decision if their preferences over policy instruments are accommodated. Administrative decisionmakers are likely to oppose decentralized instruments on several grounds: they are familiar with command-and-control approaches; market-based instruments may not require the same kinds of technical expertise that agencies have developed under command-and-control regulation; and market-based instruments imply a scaled-down role for the agency by shifting decisionmaking from the bureaucracy to private firms, undermining the agency's prestige and its staff's job security.¹⁶²

VI. CONCLUSIONS

This Article has 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, since it focuses on the decisions of individual legislators, while leaving unanswered those questions of how individual (and continuous) legislator support

160. See Hahn & Noll, *supra* note 105, at 362.

161. See *id.*

162. See Hahn & Stavins, *supra* note 104, at 14, 21.

translates into binary votes and how such support or votes are aggregated to the level of the legislature. For example, the model does not deal with the nature of competition among legislators, only briefly considers the role that congressional committees and other institutions play in structuring and influencing instrument choice, and does not explain how instrument choices are framed. Likewise, this is only a competitive legislative model as a first approximation; alternative approaches were discussed briefly. These issues represent promising avenues for extending this framework and building a workable model of instrument choice.

This Article takes 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 that a particular industry derives from a proposed regulatory program, one might 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 synthesize available explorations of the four gaps which introduced the Article: 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 reasons: the training and experience of legislators may make them more comfortable with a direct standards approach than with market-based approaches; the time needed to learn about market-based instruments may represent significant opportunity costs; standards tend to hide the costs of pollution control while emphasizing the benefits; and 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 when 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 this 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 tradeable permits as the exclusive market-based mechanism in the United States, despite the disadvantages of this allocation scheme. Like command-and-control standards, tradeable permits create rents; grandfathering distributes those rents to firms, while auctioning transfers the rents to government. Moreover, like stringent command-and-control stand-

ards 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 tradeable permits are, in effect, sustainable.

Moreover, grandfathered tradeable 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 of and familiarity with market-based instruments; niche-seeking by environmental groups interested in both environmental quality and organizational visibility; 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 for market-based instruments shifting rightward, leading to greater degrees of political support for these market-based instruments over time.¹⁶³

Although some of the current preferences for command-and-control standards simply reflects a desire to maintain the regulatory status quo, the aggregate demand for a market-based instrument is likely to be greatest (and the opportunity costs of legislator support is likely to be least) when the environmental problem has not previously been regulated.¹⁶⁴ Hence, the prospects may be promising with respect to the introduction of such market-based instruments for new problems, such as global climate change, rather than

163. It is also possible that changes in some of the institutional features identified above have affected individual legislators' degrees of support. For example, changes may have occurred that led to particular legislators taking on important committee positions, thus changing their production functions, and hence their opportunity costs.

164. See Hahn & Stavins, *supra* note 104, at 42.

for existing, regulated problems, such as abandoned hazardous waste sites.

Such 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. No empirical studies have constructed demand functions by determining how much firms actually are willing to pay (in the form of lobbying expenses and campaign contributions, for example) to secure particular outcomes. Similarly, no work has sought to determine the nature of demand by interest groups other than industry. In particular, the motives of environmental organizations merit more consideration. This Article discussed the possible self-interested motives of such organizations, and how their demands for particular policy instruments may be motivated by niche-seeking. Whether their expenditures in the political process comport with this theory remains essentially untested.

On the supply side, substantial impediments to empirical work remain. Existing studies have primarily attempted to determine the factors that affect legislative votes on particular programs.¹⁶⁵ 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, the relative dearth of new data makes it difficult to perform studies of legislative voting behavior.

Legislative voting studies also share a substantial problem: distinguishing votes that reflect a legislator's true views about a bill from votes cast as part of an implicit or explicit logrolling trade, in which a legislator votes in favor of a program that she otherwise opposes in order to obtain a more valuable quid pro quo.¹⁶⁶ Moreover, as argued above, a vote constitutes only one

165. See generally Hamilton, *supra* note 145; see also Pashigan, *supra* note 135, at 551-54.

166. Compare Kau & Rubin, *supra* note 43, at 380-81 (attempting to measure the

component of the support that a legislator can extend to a bill. But the other components of support are less well suited to quantitative analysis.¹⁶⁷ 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 decisionmaking process.¹⁶⁸

The market model 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 model 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 legislatures make, and the extent to which it facilitates the design of policy instruments that are both economically rational and politically successful.

importance of logrolling with a conditional probability model that examined votes as a function of one another) *with* Jackson & Kingdon, *supra* note 44, at 807 (criticizing aspects of Kau and Rubin study).

167. A pattern of votes on a series of amendments may be used as a proxy for a continuous underlying support variable, overcoming this problem. *See* Silberman & Durden, *supra* note 61, at 322–27. Such series of closely related votes, however, are rarely available, particularly in the case of instrument choice. A different approach has examined the relationship between campaign contributions and degrees of participation in committee activities. *See* Hall & Wayman, *supra* note 61, at 805–09.

168. *See generally* ACKERMAN & HASSLER, *supra* note 117.

