DEMAND FOR ENVIRONMENTAL GOODS: EVIDENCE FROM VOTING PATTERNS ON CALIFORNIA INITIATIVES*

MATTHEW E. KAHN
Columbia University

and

JOHN G. MATSUSAKA
University of Southern California

Abstract

This article studies voting behavior on 16 environmental ballot propositions in California in order to characterize the demand for environmental goods. The environment is found to be a normal good for people with mean incomes, but some environmental goods are inferior for those with high incomes, at least when supplied collectively. An important ''price'' of environmental goods is reduced income in the construction, farming, forestry, and manufacturing industries. Income and price can explain most of the variation in voting; there is little need to introduce ''preference'' variables such as political ideology.

I. Introduction

The environment is a good and as such should be amenable to conventional economic demand analysis. However, because it is a public good, attempts to estimate its demand function confront obstacles that are absent when studying private goods, notably, the fact that individual price-quantity transactions are not observed. This has made it difficult to resolve even the most basic questions about environmental demand. Is the environment a normal or inferior good? What are the prices of environmental goods, and who pays them? Can environmental demand be understood in terms of prices and income, or is it necessary to consider noneconomic factors such as ideology?

Researchers have attempted to answer these questions using a variety of methodologies, none of them immune to criticism.[1] Perhaps the most popu-

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[1] For examples, see Robert Cameron Mitchell and Richard T. Carson, *Using Surveys to Value Public Goods: The Contingent Valuation Method* (1989), on contingent valuation;

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lar technique is contingent valuation, which estimates willingness to pay by conducting interviews where the subject is asked to make choices under a hypothetical budget constraint; however, the demand functions yielded by such surveys often are inconsistent with economic theory, leading some researchers to conclude that contingent valuation surveys do not measure the preferences they attempt to measure.[2] Hedonic wage and rental studies measure the capitalized value of environmental goods to the marginal person but provide only limited information on inframarginal values and are poorly suited to estimate the value of environmental goods that are not localized, such as preservation of endangered species. Studies that try to infer demand from the relation between roll call votes of legislators and characteristics of constituents have been challenged on the grounds that representatives vote according to their personal ideologies rather than constituent interests.[3] Similarly, studies that measure demand by linking environmental quality directly to national income and other aggregate variables also rely on the assumption that government policies faithfully reflect the desires of the electorate.

An alternative way to estimate environmental demand is with voting data from environmental ballot propositions. A proposition presents voters with a simple yes-or-no choice whether to increase the provision of a particular environmental good. Under the assumption that those with the highest value for the good are the most likely to vote in favor, the demand function can be inferred by identifying the prices faced by each person and observing how he votes. Individual voting decisions effectively take on the role that individual consumption decisions play in conventional demand analysis. The ballot proposition method of estimating environmental demand does not suffer from the problems that arise with other methods; the issues to be decided are real, the decisions are binding, a lengthy preelection campaign period exposes voters to arguments for and against and allows time for reflection,[4] a wide variety of issues are considered, and there are no interven-

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Glenn C. Blomquist, Mark C. Berger, and John P. Hoehn, *New Estimates of Quality of Life in Urban Areas*, 78 Am Econ Rev 89 (1988), on hedonic pricing; B. Peter Pashigian, *Environmental Regulation: Whose Self-Interests Are Being Protected?* 23 Econ Inquiry 551 (1985), on voting patterns of elected representatives; and Don Coursey, *The Demand for Environmental Quality* (unpublished manuscript, Univ Chicago, Harris School Pub Pol 1992), on the linking of macro data to outcomes.

[2] Jerry A. Hausman, ed, *Contingent Valuation: A Critical Assessment* (1993); Peter A. Diamond and Jerry A. Hausman, *Contingent Valuation: Is Some Number Better than No Number?* 8 J Econ Persp 45 (1994).

[3] For example, Joseph P. Kalt and Mark A. Zupan, *Capture and Ideology in the Economic Theory of Politics*, 74 Am Econ Rev 279 (1984).

[4] Unlike opinion polls, which may change substantially as an election draws near, the final poll on election day is remarkably stable—it is difficult to think of an initiative decision that the voters subsequently reversed.

ing political agents. Deacon and Shapiro developed the theoretical underpinning for this approach and applied it to two specific issues with suggestive but promising results.[5] Aside from a study by Fischel, however, the potential of the ballot proposition approach remains largely unexploited.[6]

Our purpose in this article is to characterize demand for the environment by studying voting behavior on 16 different environmental ballot propositions in the state of California. During the last 3 decades, California voters registered their opinions on a rich menu of proposed environmental laws. The subjects of the measures ranged from protecting mountain lions and expanding parklands to imposing a bottle deposit and tightening restrictions on pesticides and toxic wastes. Our data set includes the universe of environmental initiatives that came before the state's electorate between 1970 and 1994. It was created for this study by merging county vote totals on each initiative with demographic and economic variables. By considering a wide assortment of issues, the robustness of the findings can be addressed. If similar voting patterns are observed across a number of issues, we can be more confident that the results are not driven by subtle unmeasured proposition-specific factors.

For each proposition, we estimate a cross-sectional voting regression where the unit of observation is a county. The independent variables are income and proxies for the price. Taken as a group, the estimates provide answers to three fundamental questions about demand for the environment. First, is the environment a normal or inferior good? Deacon and Shapiro and Fischel found mixed evidence of a positive income effect, but the former study expressed concern that its income variable might be capturing price effects.[7] Contingent valuation studies typically report income elasticities between zero and one, but these elasticities are too low to be consistent with concurrent findings of large divergences between willingness to pay and willingness to accept.[8] Four legislative studies of which we are aware included an income variable; all found insignificantly positive coefficients.[9]

[5] Robert Deacon and Perry Shapiro, *Private Preference for Collective Goods Revealed through Voting on Referenda,* 65 Am Econ Rev 943 (1975).

[6] William A. Fischel, *Determinants of Voting on Environmental Quality: A Study of a New Hampshire Pulp Mill Referendum,* 6 J Envtl Econ & Mgmt 107 (1979).

[7] Deacon and Shapiro (cited at note 5); and Fischel (cited at note 6).

[8] See Diamond and Hausman (cited at note 2) and the references therein. Roughly speaking, willingness to pay and willingness to accept differ by the income effect; thus, large differences imply large income effects.

[9] Pashigian (cited at note 1); Rodney Fort et al, *The Ideological Component of Senate Voting: Different Principles or Different Principals?* 76 Pub Choice 39 (1993); Dennis Coates and Michael Munger, *Legislative Voting and the Economic Theory of Politics,* 61 S

And three of the four studies using aggregate data reported a significant positive income relation, but only Coursey tried to control for prices and the control was crude.[10] Taken together, the evidence points weakly but not convincingly toward the environment being a normal good. Our estimates support this conclusion, but with some qualifications. We find a robust concave relation between income and proenvironment voting across a wide range of issues, and the point estimates indicate that the environment is a normal good at mean income levels. However, at the highest income levels, we find statistically significant evidence that certain environmental goods are inferior, particularly parklands. We suggest this does not mean that parks per se are inferior at high income levels, but that *public provision* of such goods is; the wealthy may have access to privately provided park areas, leading them to oppose additional public provision.

Demand analysis is useful only to the extent that the relevant prices can be identified. A second question is, What is the ''price'' of environmental goods, and who pays it? We explore the hypothesis that an important price (or, more naturally, ''cost'') of providing environmental goods is a loss of income to people employed in particular industries and occupations. Consistent with this view, the regressions indicate that industry and proxies for occupation are good predictors of voting on environmental initiatives. That economic interests affect voting is neither new nor surprising. What is novel is the finding that the configuration and identity of interest groups appears to be stable across widely varying issues and over time: people in construction, farming, forestry, and manufacturing, and less educated people in general are opposed; highly educated urban dwellers are in favor. This result provides a thumbnail sketch of the political economy of environmental regulation and, as we discuss below, presents a theoretical puzzle of sorts.

Our approach assumes that the environment can be understood much like any other good, in terms of price and income effects. By focusing on pecuniary measures of prices, we implicitly adopt a ''self-interest'' theory of environmental demand. Some would argue that environmental demand is driven by notions of the common good instead.[11] Such notions can be

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Econ J 861 (1995); Dennis Coates, *Jobs vs. Wilderness: The Role of Campaign Contributions,* in Roger Congleton, ed, *The Political Economy of Environmental Protection,* 1996.

[10] Coursey (cited at note 1). The other three are Gene M. Grossman and Alan B. Krueger, *Economic Growth and the Environment,* 110 Q J Econ 353 (1995); Thomas M. Selden and Daqing Song, *Environmental Quality and Development: Is There a Kuznetz Curve for Air Pollution Emissions?* 27 J Envtl Econ & Mgmt 147 (1994); and *World Development Report* (World Bank, 1992). The latter found mixed positive, negative, and nonmonotonic relations depending on the measure of pollution.

[11] ''By and large, the [economics] profession accepts the notion that social welfare and not private interest is the guiding principle for environmental legislation and regulation.'' Pashigian (cited at note 1), at 551–52.

grouped under the heading of ''political ideology'' and viewed as independent ''preference'' variables in a demand system. A third question we investigate is how much is lost by ignoring these preferences and studying the environment from a traditional (self-interest) economics perspective. We do not attempt to determine what ''really'' motivates people; rather, we follow the lead of Peltzman and consider the narrower methodological question, Is it necessary to incorporate political ideology to explain voting patterns, or can researchers simply proceed *as if* income and prices were sufficient?[12] We find that conventional income and price proxies can explain most of the variation in voting behavior. Moreover, when variables representing political ideology—party registration and presidential vote—are introduced, they add relatively little explanatory power. Economists tend to suspect that ideology and political preferences are proxies for deeper economic interests, not independent causal variables. Our results suggest that this a reasonable way to approach research on the environment.

The plan of the paper is the following. Section II provides background information on the initiative in California. Section III describes the data and methods. The set of environmental initiatives is presented along with summary statistics. An empirical model is developed and the data sources are reported. Section IV reports the results in four subsections. The first subsection examines income effects, the second looks at price effects, the third considers industry-sponsored ''counterinitiatives'' that would have eased environmental regulations, and the fourth addresses ideology. Section V summarizes and concludes.

II. The Initiative in California

The initiative is a legislative device that allows citizens to propose and approve laws without recourse to their elected representatives. In California, the initiative was made available at the state level in 1911 as part of a set of reforms associated with the Progressive movement. The initiative and other direct democracy devices such as the referendum and recall were promoted by the Progressives as a partial solution to their central concern, the apparent capture of representative government by special interests.

The mechanics of the initiative vary by location, but the basic features are the same. In order to qualify an initiative for the ballot, its sponsors must collect the signatures of a given number of registered voters. If petitioners collect enough signatures, the measure appears on the next election ballot, and if it receives a majority of the votes it becomes law. An initiative can take the form of a statute or a constitutional amendment. Since 1966,

[12] Sam Peltzman, *Constituent Interest and Congressional Voting,* 27 J Law & Econ 181 (1984).

the number of signatures required to qualify a statutory initiative for the California ballot is 5 percent of the number of votes cast in the preceding gubernatorial election; the signature requirement for a constitutional amendment initiative is 8 percent.

Citizens in California and most other states also vote on measures that are not initiatives. One class of propositions are placed on the ballot by the legislature, rather than by citizen petition. These are usually called ''referred'' or ''legislative'' measures. Another class of propositions comes to the ballot by petition but asks the voters to approve or reject an existing piece of legislation that originated in the legislature. These are typically called ''referendums,'' or ''plebiscites,'' outside the United States. Our study focuses on California initiatives over 1970–94. During this period, the electorate voted on 98 initiatives, 266 legislative measures, and 4 referendums, approving 40 percent, 73 percent, and 0 percent of them, respectively.[13]

III. Data and Methods

A. Environmental Initiatives

From the universe of California initiatives in the 1970–94 period we identified 16 that primarily concerned the environment. The year 1970 is sometimes cited as the birth year of the modern environmental movement; it contained both the passage of the federal Environmental Protection Act and the first celebration of Earth Day. Our admittedly subjective definition of an environmental initiative was an initiative that addressed the supply of pollution, natural resources, or wildlife. This is a less expansive definition of the environment than some environmental groups have adopted. As a result, we eliminated from our study several measures in which environmental organizations have taken an interest, such as Proposition 97 in 1988, which proposed to restore funding to the California Occupational Safety and Hazard Administration. We also eliminated measures that dealt only tangentially with the environment, like Proposition 11 in the 1980 primary election, which proposed to levy a profit surtax on oil companies, 5 percent of which was to be diverted to environmental preservation. It should be noted as well that we do not consider noninitiative environmental ballot measures in this study. The omitted legislative measures, primarily bond authorizations for environmental projects, and the Peripheral Canal referen-

[13] For more background information on the causes and consequences of initiatives, see John G. Matsusaka, *Economics of Direct Legislation*, 107 Q J Econ 541 (1992); and John G. Matsusaka, *Fiscal Effects of the Voter Initiative: Evidence from the Last 30 Years*, 103 J Pol Econ 587 (1995).

dum in 1982, would be interesting to consider in their own right, but exceed the bounds of this study.

Table 1 chronologically lists the environmental initiatives and provides summary information on each of them. The first column indicates the year each measure appeared on the ballot, its official number,[14] and a brief description of its topic; longer descriptions appear in the Appendix.[15] The remaining columns in Table 1 indicate the percentage of votes cast in favor statewide, the number of counties (out of 58) in which yes votes exceeded no votes, and the percentage of favorable votes in the least and most favorable county.

All of the initiatives were widely expected to increase the supply of environmental goods except Propositions 135 and 138 on the 1990 ballot. Propositions 135 and 138 were sponsored by business groups in an attempt to defuse a perceived threat from Propositions 128 and 130, respectively, on the same ballot. Both ''counterinitiatives'' were opposed by most environmental organizations and arguably would have reduced the supply of environmental goods. Proposition 9 in 1972 did not attract support or opposition from prominent environmental organizations, who considered it to be a move in the right direction but too extreme. The rest of the initiatives in Table 1 were endorsed by at least one prominent environmental organization, such as the Sierra Club, Audobon Society, or National Wildlife Federation.

More often than not environmental initiatives have been unsuccessful; only six of the 16 measures were enacted. The highwater period appears to have been 1986–90. During these years, of the initiatives endorsed by environmental organizations (we call them the ''proenvironment'' propositions for short), five of seven passed, compared to one of seven outside the period. As measured by percentage votes in favor, the most popular initiative, with 65.2 percent approval, was Proposition 70 in 1988, authorizing a $776 million bond issue to buy wildlifelands and parklands. The least popular measure was Proposition 185 in 1990, an initiative to increase gas taxes and use the proceeds for mass transit systems, parks, natural habitats, and wetlands, which received only 19.5 percent votes in favor. A substantial variation in approval rates across counties is present.[16]

[14] In our notation, Proposition 9 on the 1972 ballot is indicated ''1972–9,'' and a superscript ''p'' is added if it was on the primary election rather than the general election ballot.

[15] The information was drawn from California Journal and the Los Angeles Times.

[16] We calculated, but do not report, how frequently each county voted for the ''proenvironment'' position. The most supportive counties were in the San Francisco Bay area, with San Francisco County being far and away the ''greenest'' county. The most negative counties toward environmental initiatives were in the extreme north of the state, the northern valleys, and the San Joaquin Valley. The bellwether counties were Sacramento, Solano, and the metropolitan counties surrounding and including Los Angeles.

TABLE 1

CALIFORNIA ENVIRONMENTAL INITIATIVES, 1970–94

Proposition	Description	Total Votes, Yes %	Number of Counties in Favor	Least Favorable County, Yes %	Most Favorable County, Yes %
1972-9[p]	Pollution omnibus Required gas to be unleaded, toughened air pollution laws, banned pesticides, limited offshore oil drilling, banned nuclear power plants	35.3	0	15.8	44.2
1972-20	Coastal zone conservation Restricted development of coastal regions, shifted jurisdiction from local government to ad hoc commissions	55.2	31	17.4	70.4
1974-17	Stanislaus River protection Recommended the halt of construction of dam on Stanislaus River	47.1	12	17.3	65.1
1982-11	Bottle deposit Mandated 5 cent refund on bottles	44.1	15	29.0	62.2
1982-13	Water conservation Mandated increased water conservation	35.2	2	9.5	63.0
1986-65	Toxic disclosure Restricted release of chemicals into sources of drinking water	62.6	45	32.7	78.3
1988-70[p]	Park bonds Authorized $776 million bond issue for park and wildlife lands	65.2	40	25.8	74.9

1988-105	Toxic disclosure Required businesses to disclose information about product toxicity	54.5	25	32.9	64.4
1990-117[p]	Mountain lion protection Banned hunting of mountain lions, created fund for restoration of wildlife areas	52.4	17	19.0	67.8
1990-128	''Big Green'' (pesticides) Banned pesticides, authorized $300 million bond issue to buy redwoods, banned new offshore oil drilling, tightened water quality standards	35.7	1	12.2	62.0
1990-130	Forest preservation Banned clear-cutting of forests, authorized $742 million bond issue to buy forest land	47.9	10	15.3	70.7
1990-132	Gill net ban Banned use of gill nets in commercial fishing	55.8	32	28.2	77.3
1990-135	Counterinitiative to 128 Required state rather than business to monitor, clean up pesticide residuals	30.4	2	24.6	52.6
1990-138	Counterinitiative to 130 Made it easier for state to grant logging permits	28.8	0	19.7	48.9
1994-180[p]	Park bonds Authorized $2 billion bond issue for parks and wildlife areas	43.3	6	15.1	66.9
1994-185	Public transit, gas tax Increased gas tax, allocated the revenues for public transit, parks, and wildlife areas	19.5	0	5.3	49.7

NOTE.—Each proposition is identified by the year it appeared on the ballot, its official number, and a short description; a superscript ''p'' after the number indicates that it appeared on the primary election ballot rather than the general election ballot. For example, the first proposition appeared on the 1972 primary election ballot and was designated number 9. ''Total votes, yes %'' is the number of yes votes divided by the sum of yes and no votes. ''Number of counties in favor'' is the number of counties in which the number of yes votes exceeded the number of no votes. There are 58 counties.

B. *Empirical Model*

We are interested in characterizing the demand for environmental goods. A general formulation of demand for a particular good would be $D(I, P, X)$, where I is the consumer's income, P is the price he must pay for the good, and X represents his preferences. The problem with collectively supplied goods, as noted above, is that individual prices and quantities are not observed, leaving only indirect methods to characterize D.

Our approach is to use weighted least squares to estimate the following equation for each initiative:

$$\ln\left(\frac{F_i}{1 - F_i}\right) = \beta_0 + \beta_1 I_i + \beta_2 P_i + \beta_3 X_i + u_i. \quad (1)$$

In this equation, $i = 1, \ldots, 57$ indexes a county;[17] F_i is the fraction of votes cast in favor in county i, that is,

$$F_i = \frac{\text{votes in favor}}{\text{votes in favor} + \text{votes against}};$$

u_i is a disturbance term; and β_j are unknown parameters to be estimated. Each observation is weighted by $(n_i F_i(1 - F_i))^{1/2}$ to control for heteroscedasticity, where n_i is the number of votes cast in county i; large-county observations are given more weight.[18]

The idea behind equation (1) is intuitive. Each voter registers his preference on a proposed increase in the quantity of a particular environmental good (or a decrease in the case of Propositions 135 and 138). By linking his vote to his income and prices, a picture of his underlying demand emerges. In a sense, voting decisions are used in place of the missing consumption decisions.

The log-of-the-odds formulation is common in studies using voting data from ballot propositions.[19] It is a simplified version of the approach in Deacon and Shapiro.[20] Dubin, Kiewiet, and Noussair developed conditions un-

[17] We omit tiny Alpine County near Lake Tahoe because a majority of the registered voters in the county live there only part of the year; the census information for the county does not appear to represent the characteristics of its voters.

[18] G. S. Maddala, *Limited Dependent and Qualitative Variables in Econometrics* (1983).

[19] See, for example, Larry D. Schroeder and David L. Sjoquist, *The Rational Voter: An Analysis of Two Atlanta Referenda on Rapid Transit*, 33 Pub Choice 27 (1978); John E. Filer and Lawrence W. Kenny, *Voter Reaction to City-County Consolidation Referenda*, 23 J Law & Econ 179 (1980); and Jeffrey A. Dubin, D. Roderick Kiewiet, and Charles Noussair, *Voting on Growth Control Measures: Preferences and Strategies*, 4 Econ & Politics 191 (1992).

[20] Deacon & Shapiro (cited at note 5).

der which the β_j parameters can be interpreted as parameters in the utility function of a representative consumer and also provided a theoretical rationale for our choice of weights.[21] Weighting is called for when the individual errors are independent; because of averaging, the large-county observations have smaller errors (are more informative) than the small-county observations. If the within-county errors are positively correlated, as they may be if there are omitted county-specific variables, then weighting can make things worse. It turns out that the results are essentially the same regardless of whether the regressions are weighted. To conserve space, we do not report the unweighted regressions, but they are briefly summarized in the text.

Although microfoundations are available for our approach, the validity of the assumptions required to justify them has not been established empirically. A cautious interpretation of the estimates would be as reduced-form parameters. The main reason we use aggregate data in this article is that comparable survey data are not available. A prominent study by Fischel used data from a survey that he conducted to study voting on environmental measures in New Hampshire localities.[22] He concluded that the technique of analyzing data from individual voters gave results similar to those utilizing community averages and, consequently, provided some justification for the employment of aggregate data in such tasks. Nevertheless, it should be kept in mind that our study employs ecological regressions, and the usual caveats apply.

Our decision to study county-level voting patterns limits the number of observations in each regression. This in turn restricts the number of explanatory variables we can explore. The number we use still compares favorably with previous studies; and as a practical matter, the coefficient estimates are sufficiently precise to attain statistical significance, and the explanatory power of the regressions is sizeable. We deliberately do not take cities as our unit of observation as Deacon and Shapiro did because this would make it difficult to study the behavior of voters employed in agricultural industries and, as shown below, would thus fail to capture a key dimension of environmental demand.[23]

C. Explanatory Variables

Equation (1) is a typical demand equation, except that the dependent variable is not the quantity of the good but the log-of-the-odds of a favor-

[21] Dubin, Kiewiet, and Noussair (cited at *supra* note 19). Like most studies, we do not address the problem that the set of voters are not a random sample of county residents.

[22] Fischel (cited at note 6).

[23] Deacon and Shapiro (cited at note 5).

able vote. To determine the effect of income, β_1, we use mean per capita county income in 1983 dollars for I_i. Both income and income squared are included to allow the income effect to vary as people become richer.[24]

Because the price, P_i, is not directly observable, we include a vector of variables that are likely to be correlated with it. Seven price variables are considered. They were selected based on information culled from official election documents and articles in *California Journal* and the *Los Angeles Times.* In general, the ''price'' of a proposed increment of an environmental good to voters in a given county is the amount those voters would have to give up in order for the good to be supplied. Perhaps the most plausible price, in this opportunity cost sense, is the income and employment that would be lost. For example, the price of increasing the supply of forestland is likely to be positively correlated with the amount of income a county derives from the timber industry. This reasoning suggests that the price of an initiative to a county may depend on the industrial makeup of its economy. Accordingly, four of our price variables are a county's per capita income from the construction, farming, forestry, and manufacturing industries.[25] The cost of environmental goods extends into other industries as well if displaced workers can migrate, pushing down wages in their new industry. Workers in construction, farming, and forestry are less educated on average than other workers; if environmental legislation hurts these industries, then it also ultimately poses a threat to less educated workers in all industries. The flip side is that environmental legislation is unlikely to threaten the employment of highly educated workers. To allow for this possibility, we include in the P_i vector a variable equal to the fraction of a county's population with a college degree.[26] The sixth price variable is the percentage of a county's population residing in a city, and the seventh is a dummy variable for the northern counties. As explained below, these last two variables are intended to capture differential costs in the provision of water- and park-related goods.

The variables included in the P_i vector vary from initiative to initiative. Some degree of arbitrariness is unavoidable in deciding what variables to include in a particular regression. We err on the side of including too many, rather than too few, variables for two reasons. First, we want to facilitate

[24] We estimated the regressions with linear, logarithmic, and quadratic-in-the-logarithm specifications as well. The results using the quadratic-in-the-log specification were virtually identical to those we report; with the other two specifications, the fit of the models was inferior.

[25] We tried using industry employment instead of income in the regressions and found similar results.

[26] We also tried an education variable equal to the proportion of a county with a high school diploma, but the fit was inferior.

estimation of the income effect—exclusion of a relevant variable might bias the income coefficients but inclusion of an irrelevant variable will not. Second, in some cases we do not have strong prior information about what variables are appropriate, and rather than take a stand we think it is better (and more informative) simply to let the data tell us. We follow several other selection rules. If an initiative seems likely to have had a differential effect on, or was sponsored or opposed by, one of our four industries, that industry variable is included. When an initiative concerned water, three variables are included: farm income, city population, and the north dummy. This reflects the nature of California water politics that center around use of water from the Sacramento–San Joaquin Delta and pit the water-rich north against the arid south and urban users against irrigating farmers.[27] The city and farming variables are included whenever parks were involved because park expenditure often goes to municipalities (this explains the otherwise anomalous tendency for big-city police chiefs to support park measures, which they view as a way to reduce crime by cleaning up deteriorating parks and playgrounds). Education is included in all regressions because each measure had some job-related consequences. Our specific choice of price variables for each initiative is explained in the appendix.

The parameter β_3 indicates pure preference effects on the demand for environmental goods. We begin by estimating equation (1) under the assumption that $\beta_3 = 0$ in order to determine how much can be explained without reference to preference variables. Then we introduce preference variables, X_i, and measure how much explanatory power they add. Preferences cannot be observed directly so we employ variables that are likely to be correlated with a voter's political preferences. The two measures used are the percentage of county voters registered as Democrats and the percentage of the vote received by the Democratic candidate in the current or preceding presidential election.[28]

D. Data Sources

Table 2 lists the explanatory variables and provides a precise description of each one. Vote totals and party registration numbers were drawn from

[27] For example, see *Vital State Water Project in Fiscal Crisis Is Beset by Environmental Controversy,* 1 Cal J (February 1970); *Water: Where Do We Go From Here?,* 13 Cal J (September 1982); and *Water, Water: Does the State Need a New Way of Thinking about a Vital Resource?* 19 Cal J (March 1988).

[28] The denominator of the first measure is the number of registered Democrats and Republicans. In California, citizens declare their party affiliation when they register to vote; this allows them to participate in the ''closed'' primary elections. The denominator of the second measure is combined votes for the Democratic and Republican candidates.

TABLE 2

INDEPENDENT VARIABLES, DEFINITIONS, AND SUMMARY STATISTICS

Variable	Definition
Income	Per capita annual county income in thousands of 1983 dollars.
Construction, Farming, Forestry, and Manufacturing	Per capita annual county income from the indicated industry in thousands of 1983 dollars.
Education	Fraction of county population with 16 or more years of education; 1970 census numbers are used for 1972 and 1974, 1980 census numbers are used for 1982, and 1990 census numbers are used otherwise.
City	Fraction of county population residing in a city as opposed to an unincorporated area as of January 1, except for 1972, which is as of April 1.
Registered Democrats	Registered Democrats as a fraction of registered Democrats and Republicans, as of the primary and general election.
Democratic votes for president	Votes received by the Democratic party presidential candidate as a fraction of votes for the Democratic and Republican candidates, in the concurrent or preceding presidential election.
North	Dummy variable equal to 1 for all counties but Imperial, Kern, Los Angeles, Orange, Riverside, San Bernardino, San Luis Obispo, San Diego, Santa Barbara, and Ventura.

								Registered Democrats		Democratic Votes for
Year	Income	Construction	Farming	Forestry	Manufacturing	Education	City	Primary	General	President
1972	11.6	.53	.84	.010	1.25	.11	.48	.60	.61	.43
	(1.7)	(.26)	(1.28)	(.034)	(.88)	(.04)	(.24)	(.05)	(.05)	(.06)
1974	12.2	.50	1.31	.012	1.23	.11	.48	. . .	.61	.43
	(2.4)	(.22)	(2.35)	(.040)	(.83)	(.04)	(.24)		(.05)	(.06)
1982	12.0	.42	.52	.001	1.03	.16	.49	. . .	.59	.39
	(2.5)	(.25)	(.66)	(.003)	(.90)	(.06)	(.26)		(.06)	(.07)
1986	13.4	.67	.41	.014	1.19	.19	.51	. . .	.57	.40
	(3.1)	(.32)	(.53)	(.057)	(.99)	(.08)	(.25)		(.07)	(.08)
1988	13.6	.70	.54	.001	1.21	.19	.52	.57	.56	.46
	(3.3)	(.35)	(.77)	(.002)	(1.00)	(.08)	(.26)	(.07)	(.07)	(.08)
1990	13.8	.71	.46	.006	1.14	.19	.52	.55	.55	.46
	(3.4)	(.35)	(.71)	(.016)	(.98)	(.08)	(.26)	(.07)	(.07)	(.08)
1994	13.4	.60	.37	.006	1.07	.19	.54	.55	.55	.54
	(3.3)	(.26)	(.57)	(.016)	(.93)	(.08)	(.27)	(.08)	(.08)	(.10)

NOTE.—The main cell entry is the mean; standard errors are in parentheses. Statistics are computed over 57 observations (omitting Alpine county). The 1994 regressions use personal and industry income numbers from 1992.

California's official election returns, *Statement of Vote*, published by the California Secretary of State (Sacramento, Cal.). City population percentages were calculated from information in various years of *California County Fact Book*, published by County Supervisors Association of California, (Sacramento, Cal.), and *California Statistical Abstract*, published by the California Secretary of State (Sacramento, Cal.). The rest of the data were taken from the 1993 version of the Regional Economic Information System CD-ROM, Bureau of Economic Analysis in the U.S. Department of Commerce (Washington, D.C.).

IV. Results

Table 3 reports the parameter estimates, and beneath them in parentheses standard errors, for the 14 ''proenvironment'' initiatives. The table is organized so that each row presents the regression coefficients for the initiative indicated in the first column. The last column reports the $\bar{R}^2$.

The collection of numbers in Table 3 is difficult to digest all at once, so we analyze it in more bite-sized pieces below. At this point, some broad characteristics of the estimates are worth noting. First, measured by $\bar{R}^2$, the regressions seem to provide a good fit for the data. Every regression explains over half of the variation in county voting; 10 regressions explain over 60 percent of the variation, and four explain over 70 percent. Second, the somewhat confining sample size of 57 observations does not appear to prevent achievement of precise coefficient estimates. For example, the income coefficients are statistically significant at the 10 percent level in 11 of 14 measures, and at least one industry variable is significant in all but two regressions.

A. Income

Many people are convinced by introspection that the environment is a normal good, but as the brief survey in the introduction indicates, reliable statistical evidence in support of this belief is lacking. In order to make reliable estimates of the income effect, prices must be held constant. The performance of the price proxies is thus encouraging.

Table 3 clearly shows that income matters for environmental voting. Moreover, the relationship between voting for environmental goods and income appears to be concave. Except for 1974-17, all coefficients reveal a concave relationship, and the estimates are statistically significant for 10 initiatives, including all of them since 1986. In itself, this does not tell us whether the environment is a normal or inferior good; concavity implies that it is normal for low-enough incomes and inferior for high-enough incomes.

We can assess whether the environment is a normal or inferior good at

TABLE 3

LOGISTIC WEIGHTED LEAST SQUARES VOTE REGRESSIONS, PROENVIRONMENT INITIATIVES

Initiative	Income	Income^2	Construction	Farming	Forestry	Manufacturing	Education	City	North	Constant	$\bar{R}^2$
1972-9[p]	1.73	−.390	. . .	−.99	. . .	1.20***	.62	. . .	. . .	−2.48	.552
Pollution	(2.27)	(.797)		(.68)		(.36)	(1.10)			(1.52)	
1972–20	4.26**	−1.513**	.95	−1.27**	−10.57***	.05	1.37	. . .	.24***	−3.04**	.519
Coastal zone	(2.01)	(.719)	(2.57)	(.62)	(3.60)	(.32)	(1.04)		(.06)	(1.35)	
1974-17	−2.71	.943	. . .	−1.04**	. . .	. . .	4.17**	.26	.05	1.05	.503
Stanislaus River	(2.09)	(.706)		(.41)			(1.11)	(.22)	(.06)	(1.43)	
1982-11	0.97	−.292	. . .	1.33	. . .	.05	2.47**	. . .	.33***	−1.68**	.630
Bottle deposit	(1.12)	(.363)		(.81)		(.23)	(.98)		(.06)	(.82)	
1982-13	2.47	−.681	1.59	−2.70**	. . .	−.43	2.65*	.85***	.11	−3.88***	.689
Water	(1.72)	(.536)	(2.43)	(1.24)		(.36)	(1.41)	(.31)	(.08)	(1.24)	
1986-65	2.47***	−.628***	. . .	−4.07***	. . .	−.75**	−.004	.50***	. . .	−1.92***	.644
Toxic disclosure	(.87)	(.235)		(.93)		(.20)	(.88)	(.18)		(.68)	
1988-70[p]	3.54***	−.956***	−6.25***	−3.43***	−57.18***	−.58**	.96	.48**	.19***	−2.44***	.616
Park bonds	(1.05)	(.276)	(1.82)	(.91)	(20.83)	(.24)	(1.11)	(.21)	(.07)	(.81)	
1988-105	1.88**	−.467**	−9.19***	−3.49***	. . .	−.28	1.40	. . .	. . .	−1.03*	.586
Toxic disclosure	(.75)	(.204)	(1.47)	(.76)		(.20)	(.87)			(.61)	
1990-117[p]	2.87***	−.698***	−6.72***	−2.40***	−12.59***	−.44**	.97	.44**	. . .	−2.51***	.748
Mountain lions	(.76)	(.193)	(1.55)	(.76)	(4.03)	(.20)	(.87)	(.17)		(.58)	
1990-128	3.44***	−.851***	−12.25***	−4.55***	−5.32	−1.04***	2.48**	.35	.21***	−3.52***	.673
''Big Green''	(1.05)	(.267)	(2.16)	(1.14)	(5.83)	(.27)	(1.22)	(.23)	(.08)	(.82)	
1990-130	2.36***	−.571**	−8.14***	−2.75***	−12.27**	−.63***	2.24**	.42**	.18***	−2.43***	.715
Forests	(.88)	(.225)	(1.76)	(.91)	(4.89)	(.23)	(1.01)	(.19)	(.06)	(.68)	
1990-132	1.96***	−.439**	. . .	. . .	. . .	−.22	1.67*	. . .	.13***	−2.15***	.697
Gill nets	(.71)	(.186)				(.18)	(.88)		(.05)	(.57)	
1994-180[p]	3.32***	−.795***	−12.48***	−3.09**	−8.98	−.79***	1.90	.64***	.20**	−3.46***	.733
Park bonds	(.98)	(.256)	(2.47)	(1.34)	(6.00)	(.29)	(1.23)	(.22)	(.08)	(.75)	
1994-185	1.89*	−.504*	−1.08***	−2.36	. . .	−1.01***	5.11***	.42	.51***	−3.97***	.738
Public transit	(1.12)	(.289)	(.30)	(1.62)		(.31)	(1.46)	(.25)	(.09)	(.85)	

NOTE.—Each row is a regression; standard errors are in parentheses beneath coefficient estimates. The dependent variable is the log of the odds of a favorable vote. Dependent variables are defined in Table 2. Income, Construction, Farming, and Manufacturing estimates are multiplied by 10 for ease of presentation; Income^2 is multiplied by 100. Each regression has 57 observations.

* Significant at the 10 percent level.

** Significant at the 5 percent level.

*** Significant at the 1 percent level.

any given income level using the estimates in Table 3. These estimates are reliable only for incomes that lie within the sample. Table 4 reports the minimum and maximum (county mean) income in the sample for each initiative. Except for 1972-9, the turning point in the relation falls within the sample distribution. Thus, the estimates appear to be telling us that environmental goods are inferior for some incomes within the sample. It follows that we will not be able to conclude with statistical confidence that the environment is uniformly a normal or inferior good. We focus instead on measuring the income effect at two specific income levels, the (unweighted) mean level of income as seen in Table 2, and the maximum level of income. The former might be considered the ''average'' income effect, while the latter is the most likely to provide evidence of inferiority.

Table 4 reports the derivative of percentage votes in favor with respect to a change in income (measured in thousands of dollars), $\partial F/\partial I$, in the notation of equation (1). The derivatives are calculated using the estimated log-of-the-odds models in Table 3. For the first set of derivatives, all the independent variables including income are set at their mean values. As an example of how to read the table, a $1,000 increase in income at the mean results in a 1.7 percent increase in ''yes'' votes for 1972-9. Except for 1974-17, the point estimates indicate that the environment is a normal good. In the column to the right of the point estimates, we report the *F*-statistics for the hypothesis that the derivative is equal to zero. These are calculated in the usual way by imposing a linear restriction on the parameters. It is possible to reject the hypothesis that the derivative is equal to zero for 10 initiatives, and the estimate for 1982-13 just escapes statistical significance. We also calculated but do not report a set of *F*-statistics from a pooled random effects (by county) model in which we imposed the condition that the error variances are equal across initiatives. In theory, these estimates are more efficient. They gave similar results: a statistically significant positive relation between income and voting for the environment was found for the same 10 initiatives.

Table 4 also reports the derivatives evaluated at the maximum level of income, with all other independent variables fixed at their mean values, and the corresponding *F*-statistics. According to the point estimates, the environment is an inferior good for high-income people in 12 of 14 measures, and all of them since 1982. Six of the derivatives can be distinguished from zero at the 10 percent level in the basic model (five were statistically different from zero in the pooled random effects model).[29] Of the six measures

[29] To check whether these findings were a statistical artifact of our second-order specification, we also ran the regressions with splines that divided income into three groups. We found significant negative segments for the upper income group in the same six equations and several others.

TABLE 4

PERCENTAGE VOTE IN FAVOR, DERIVATIVE WITH RESPECT TO INCOME, EVALUATED AT THE MEAN AND MAXIMUM INCOME

	INCOME		DERIVATIVE AT MEAN		DERIVATIVE AT MAXIMUM	
INITIATIVE	Min	Max	Point Estimate	*F*	Point Estimate	*F*
1972-9[p] Pollution	9.2	17.3	1.70	3.03*	.88	.45
1972-20 Coastal zone	9.2	17.3	1.84	3.14*	−2.45	3.20*
1974-17 Stanislaus River	9.6	24.6	−1.27	.84	4.45	1.82
1982-11 Bottle deposit	8.8	21.8	.68	.76	−.74	.31
1982-13 Water	8.8	21.8	1.57	2.47	−1.02	.45
1986-65 Toxic disclosure	9.4	25.3	1.95	6.44**	−1.72	2.92*
1988-70[p] Park bonds	9.0	26.0	2.27	6.54**	−3.58	9.11***
1988-105 Toxic disclosure	9.0	26.0	1.53	5.77**	−1.36	2.01
1990-117[p] Mountain lions	9.5	26.5	2.31	11.54***	−2.08	5.71**
1990-128 ''Big Green''	9.5	26.5	2.25	8.22***	−2.30	5.25**
1990-130 Forests	9.5	26.5	1.88	6.05**	−1.65	2.81
1990-132 Gill nets	9.5	26.5	1.87	8.89***	−.88	1.09
1994-180[p] Park bonds	8.3	25.7	2.66	10.30***	−1.87	2.85*
1994-185 Public transit	8.3	25.7	.74	1.58	−.92	1.97

NOTE.—Income ''Min'' and ''Max'' are the minimum and maximum county mean income. The derivative is the change in percentage of favorable votes with respect to a change in (thousands of dollars of) income, computed from the log-of-the-odds model (1). The derivative is evaluated at the mean or maximum income, and mean values of all other explanatory variables. The *F*-statistic is for the hypothesis that the derivative of the log-of-the-odds with respect to income is equal to zero.

* Significant at the 10 percent level.

** Significant at the 5 percent level.

*** Significant at the 1 percent level.

that the wealthy viewed as inferior goods, a common theme was the intent to increase provision of public spaces. For example, 1972-20 proposed to conserve coastal areas and 1988-70, 1990-117, 1990-128, and 1990-180 allocated funds for parks, forests, and recreation areas. It is probably incorrect to say that the rich view parks and their like as inferior goods. Instead, it may be that they can purchase these goods privately (in the form of a vacation, a vacation home, a private campground, and so on) and so view *public provision* of these goods as undesirable. This echoes the argument of Barzel that high-income families might vote against an increase in public education because they have access to private schools.[30] A similar argument may explain the inferiority of 1986-65, if the rich are more likely to purchase their drinking water privately (bottled water) than use tap water.

Until more research is available, we cannot rule out the possibility that income is proxying for price. It could be that the legislation we study contained subtle and unmeasured (by us) details that imposed disproportionate costs on the poorest and richest voters.[31] We have no reason to accept this hypothesis, but if true it would be consistent with Director's Law.[32]

The regressions were estimated in several other ways that we do not present, primarily to check the robustness of the findings. First, we ran them unweighted. A concave relation appeared in the same 13 initiatives, and the coefficients were statistically significant for seven of them. In every case, the turning point was within the sample distribution and the income effect was negative at the maximum income level. Second, we replaced the income variable with a variable equal to the average income in the current and 2 preceding years. This was intended as a crude proxy for permanent income. Again, the results were virtually identical. The concave relationship was observed for all but 1974-17, and the relationship was statistically significant for the same 10 initiatives. Finally, we estimated a set of regressions that included only income, income squared, and a constant as explanatory variables, mainly for comparison with the estimates of Selden and Song and Grossman and Krueger.[33] All equations were concave. The income effect was positive at the mean income for all initiatives and signifi-

[30] Yoram Barzel, *Private Schools and Public School Finance,* 81 J Pol Econ 174 (1973).

[31] In principle, the tax code could induce income-price effects, but it is probably not a factor in California. We would be concerned if the income tax rose sharply at high income levels; then the rich might expect to end up paying for the bulk of any new spending. But in California an individual hits the top tax bracket at an income of about $21,000 1983 dollars (ignoring the temporary surcharge from 1991 to 1995). See the Cal Rev & Tax Code, § 17041.

[32] George J. Stigler, *Director's Law of Public Income Redistribution,* 13 J Law & Econ 1 (1970).

[33] Selden and Song (cited at note 10); and Grossman and Krueger (cited at note 10).

cantly different from zero for all but the bottle deposit measure. At the maximum income, the income effect was positive in four cases (significantly for 1982-11 and 1994-185) and negative in 10 cases (significantly for the two park and wildlife area measures).

B. Prices

The four industry variables, education, city population, and the north dummy are included to capture price effects on environmental demand. The main reason we include these variables is to isolate the income effect, but they are of some interest in their own right. Our conjecture is that an important cost of supplying environmental goods is a loss of income to individuals in particular occupations.

Based on press accounts and other research, natural resource industries and manufacturing were the most likely to have suffered from environmental initiatives. The parameter estimates on the industry variables are consistent with this hypothesis. Construction counties showed a significant tendency to vote no on seven of nine measures, five of which would have set aside undeveloped land. Farm counties supported only the bottle deposit measure, which would have lowered their production costs, and voted significantly against 10 of 13 initiatives. Forestry counties also voted against measures that threatened their income; significant negative coefficients were found for 1972-20, 1988-70, 1990-117, and 1990-130, and insignificant negative coefficients for 1990-128 and 1994-180. Manufacturing counties had significant coefficients in opposition for seven of 13 measures. The manufacturing coefficient for 1972-9 is the only significant positive industry coefficient in the entire table. Thus, the hypothesis that opposition to environmental initiatives comes from workers in displaced industries finds broad support.

Education is included to capture within-industry variations in the economic effect of environmental initiatives. The coefficients on the industry variables indicate that the measures in our sample had adverse effects on the earnings of people employed in construction, farming, forestry, and manufacturing. If workers in these industries are less skilled than workers on average and labor is mobile, then less skilled workers in all industries will experience an earnings decline. Consequently, less educated workers in general will oppose environmental initiatives. In fact, Table 3 reports positive education coefficients for all but one measure and statistically significant coefficients for seven of 14.[34]

[34] Some other explanations for the education effect are worth noting. Education may increase ''appreciation capital'' for the environment in the same way that music training develops human capital that increases demand for music: George J. Stigler and Gary S. Becker,

City dwellers were more likely to vote in favor of the environment, and the effect is significant in six of nine initiatives. One of these initiatives promised more water for cities (1982-13), and four provided funds for parks, many of which are located in urban areas.

The coefficient on the north dummy is always positive and achieves statistical significance for eight of 10 initiatives. There does not seem to be a general reason for this, but rather a number of initiative-specific considerations, for example, the gill net ban off the coast of southern California (1990-132) and provision of public transit primarily in northern California (1994-185).

The price proxies reveal a remarkable stability in voting patterns across time and issues that is not predicted by theory.[35] It seems that environmental initiatives consistently impose the cost of providing environmental goods on the same groups, namely, workers in the construction, farming, forestry, and manufacturing industries and less educated workers in general. It could be done otherwise; for example, 1990-130 could have been written to include a subsidy to displaced timber workers financed by a tax on highly educated workers such that the educated ended up bearing the costs of more forestland. Why individuals in displaced industries are never fully compensated for their costs is an open theoretical question, perhaps related to deadweight and transaction costs in redistributing income as suggested by Becker,[36] or perhaps natural resource industries are relatively strong in the state legislature, forcing relatively weaker interests to take their cases directly to the electorate. Further research is needed to untangle this.

C. Counterinitiatives

Table 5 presents regressions for the two counterinitiatives (1990-135, 1990-138). The format is the same as Table 3. These regressions serve as

De Gustibus Non Est Disputandum, 67 Am Econ Rev 76 (1977); it may reduce the cost of acquiring information about initiatives—uninformed voters tend to vote against ballot propositions: David B. Magleby, Direct Legislation (1984); or it may pick up industry effects that slip through our broad classifications. There are also non–price theoretic explanations. Some environmentalists would argue that the educated are more ''enlightened'' about the benefits of preserving the environment, that what separates them from the population at large is education about the issues. One of the purposes of the Sierra Club, according to its bylaws is ''to educate and enlist humanity to protect and restore the quality of the natural and human environment.'' Michael P. Cohen, *The History of the Sierra Club, 1982–1970*, at 455 (1988).

[35] The coefficients in the unweighted regressions were similar: education was always positive, and it was statistically significant at the 10 percent level in 13 of 14 cases; the industry variables were negative in 35 of 41 cases, and they were significant in 15; the city variable was always positive, and it was significant in eight of nine initiatives; and the north dummy was positive in seven of 10 cases, significant in two.

[36] Gary S. Becker, *A Theory of Competition among Pressure Groups for Political Influence*, 98 Q J Econ 371 (1983).

TABLE 5

LOGISTIC WEIGHTED LEAST SQUARES VOTE REGRESSIONS, COUNTERINITIATIVES

Counterinitiative	Income	Income^2	Construction	Farming	Forestry	Manufacturing	Education	City	North	Constant	$\bar{R}^2$
1990-135	−.19	.132	. . .	3.20***	. . .	.19*	−2.13***	−.07	. . .	−.41	.740
Counter to 128	(.40)	(.103)		(.40)		(.11)	(.49)	(.08)		(.31)	
1990-138	−.43	.160	2.63**	.74	9.00***	.29*	−2.35***	−.29**	−.18***	−.07	.665
Counter to 130	(.57)	(.146)	(1.10)	(.55)	(2.57)	(.15)	(.64)	(.12)	(.04)	(.43)	

NOTE.—Each row is a regression; standard errors are in parentheses beneath coefficient estimates. The dependent variable is the log of the odds of a favorable vote. Dependent variables are defined in Table 2. Income, Construction, Farming, and Manufacturing estimates are multiplied by 10 for ease of presentation; Income^2 is multiplied by 100. Each regression has 57 observations.

* Significant at the 10 percent level.

** Significant at the 5 percent level.

*** Significant at the 1 percent level.

a check on the interpretation of the results. In order to make inferences about demand from voting data, it must be true that voters have enough information to cast their vote for the outcome that is in their best interest. If voters understand their best interest, we expect to see certain patterns when comparing initiatives and counterinitiatives. The clearest case is 1990-130 and 1990-138. The first measure arguably proposed to increase the supply of forests, while the counterinitiative proposed to decrease the supply. If citizens vote sincerely, then those who favored 1990-130 should have opposed 1990-138, and vice versa. This implies a mirror pattern in the coefficients like what is observed; each positive parameter estimate in 1990-130 is matched by a negative estimate in 1990-138, and vice versa. The case of 1990-128 and 1990-135 is more complicated because 1990-135 appeared to be a compromise between 1990-128 and the status quo. In California, when two conflicting measures each receive more than 50 percent of the vote, the one with the highest percentage takes effect. Thus, we do not have a clear prediction as far as the pattern. However, insofar as 1990-135 tended to be viewed as a close substitute for the status quo, the approximate mirroring that is seen is reasonable.

D. Economics and Ideology

One of the objectives of this article is to see how well the environment can be understood as a conventional economic good, that is, without introducing noneconomic preference variables. We address this issue in statistical terms, by measuring the ability of income and our fairly crude price proxies to explain environmental voting. At first glance, Table 3 provides broad support for an economic approach. As measured by $\bar{R}^2$, price and income can account for a majority of the variation in county voting for all initiatives. It is doubtful that demand estimates for traditional goods would produce markedly better fits.

There may be ideological variables with equally impressive explanatory power. For example, it may be possible to explain a person's environmental voting by his position on a liberal-conservative spectrum. However, as economists we are inclined to push in the direction of price and income effects as long as that seems productive.[37] If we find that it is possible to

[37] The underlying methodological position was stated by Peltzman (cited at note 12), at 192: ''Suppose an economist initially seeks to explain auto purchases with two variables—price and party registration—and finds that party is clearly the more important of the two variables. An economist, unlike a sociologist or a political scientist, would probably suspect that party is simply a proxy for income. Now, suppose an ordinary price-cum-income demand relationship explains the data about as well as price-cum-party, but that party provides some small marginal explanatory power. This result would sooner lead the economist to elaborate the role of income (or price) than to undertake serious analysis of the role of party preference on durable goods purchases. Had the ordinary demand function failed utterly to reduce the

explain environmental voting with variables plausibly related to price and income, then we have justification to continue refining and elaborating the economic variables. If prices and income fail to organize the data, then ideological or political approaches would be called for.[38]

Although the full regressions appear to fit the data well, a nontrivial amount of cross-sectional variation remains to be explained. This residual may be explicable by the coarseness of our price proxies. It may also be driven by ideological factors. The fact that economic variables can explain the bulk of environmental voting does not rule out a marginal role for ideology.

The possibility of such a role is first assessed by reestimating the regressions in Table 3 with an ideology variable added. We try two different ideology variables, the fraction of a county's population registered as Democrats, and the fraction of the county vote that went to the Democratic candidate in the most recent presidential election. Political party identification typically is believed to be correlated with ideology. The component of party identification that is determined by income and occupation is controlled by those variables in the regression. To the extent that there is an independent component of ideology that influences environmental voting, that is, a component that is not induced by economic factors, it should be seen in the coefficient on the party variable.

Table 6 contains information based on these regressions that attempts to measure how much explanatory power is added by the ideology variables.[39] The first measure of explanatory power is $\bar{R}^2$. For reference, the first column reproduces the $\bar{R}^2$s from the basic regressions in Table 3. The next two columns report the increase in $\bar{R}^2$ associated with the addition of an ideology variable into the regression. For example, when the registered Democrats variable is added to the equation for 1972-9, the $\bar{R}^2$ rises from 0.552 to 0.598, a change of 0.046. When the presidential vote is added instead, the $\bar{R}^2$ increases by 0.065. The bottom row, labeled ''Combined,'' is the explained sum of squares for all initiatives divided by the total sum of squares for all initiatives.

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plausible role of political preference, some pessimism about the future of economic versus sociological analysis of car buying would be warranted.''

[38] For an interesting example of the opposite approach, see Keith T. Poole and Howard Rosenthal, *The Enduring Nineteenth Century Battle for Economic Regulation*, 36 J Law & Econ 837 (1993).

[39] The party coefficients are positive in all but the counterinitiative regressions. They are statistically significant at better than the 10 percent level for all initiatives but 1974-14 using the registration variable and significant at the 5 percent level in all regressions using the presidential vote variable. The parameter estimates on the other coefficients are similar to those reported in Table 3. The main difference is that the north dummy reverses sign in seven cases.

As it turns out, the presidential vote variable is slightly more effective than the party registration variable, and the usefulness of the ideology variables varies across initiatives. At one extreme, ideology increases the explanatory power of the ''Big Green'' equation by roughly 25 percent using either measure. The $\bar{R}^2$ rises by 15 percent or more for nine initiatives with the introduction of registration measure and for eight initiatives with the introduction of the presidential vote measure. In contrast, ideology adds only 1.6 percent to the Mountain Lion and Stanislaus River initiatives using the registration measure (2.3 percent and 2.9 percent, respectively, with the other measure). The increment is less than 10 percent for seven initiatives using the registration measure and six initiatives using the presidential vote measure. Taking all 16 initiatives together, ideology adds 0.128, or 0.142, to the $\bar{R}^2$, depending on the measure. Thus, while price and income can explain most of the variation, it seems that party preferences can be useful in explaining some of the residual variation. Whether the increased $\bar{R}^2$'s are caused by party proxying for unmeasured prices or ideology cannot be determined here.

We call the second measure of explanatory power the model's ''classification accuracy.'' Whereas $\bar{R}^2$ indicates the ability to explain variation in the log-of-the odds of votes, classification accuracy is based on variation of vote probabilities. Let F_i^1 be the actual fraction of favorable votes in county *i.* A simple (intercept-only) model would predict that the turnout fraction in each county is equal to the overall turnout fraction in the state, call it F^0. If n_i is the number of votes cast in county *i,* the simple model would have an ''error rate'' of $\Sigma_i|F_i^1 - \mathrm{F}^0|n_i$. The classification accuracy is defined relative to the error rate. Let F_i^2 be the predicted fraction of yes votes based on the Table 3 models. Then

$$\text{classification accuracy} = 1 - \frac{\Sigma_i|F_i^2 - F^0|n_i}{\Sigma_i|F_i^1 - F^0|n_i}.$$

These are the numbers presented in the ''Classification Accuracy'' column of Table 6. The following two columns report how much the classification accuracy rises when the F_i^2 are replaced by predictions from ideology-augmented models.

The classification accuracy of the Table 3 models ranges from a low of 0.344 to a high of 0.535. Ideology adds from 0.023 to 0.350 when measured by party registration, and from 0.045 to 0.377 when measured by presidential vote. When the variation in all 16 measures is combined, the standard economic model has a classification accuracy of 0.466, and the ideology measures increase it by about 20 percent. The classification accuracy measures appear to tell a similar story to the $\bar{R}^2$ measures: price and income can

TABLE 6

ADDITIONAL EXPLANATORY POWER WHEN REGRESSIONS INCLUDE IDEOLOGY VARIABLES

		Regressions with Ideology			Regressions with Ideology	
	Table 3 $\bar{R}^2$	Registered Democrats	Democratic Votes for President	Classification Accuracy	Registered Democrats	Democratic Votes for President
1972-9[p] Pollution	.552	+.046	+.065	.453	+.065	+.081
1972-20 Coastal zone	.519	+.169	+.217	.344	+.231	+.285
1974-17 Stanislaus River	.503	+.016	+.029	.388	+.023	+.045
1982-11 Bottle deposit	.630	+.059	+.088	.503	+.058	+.072
1982-13 Water	.689	+.222	+.237	.480	+.350	+.377
1986-65 Toxic disclosure	.644	+.098	+.127	.373	+.169	+.204
1988-70[p] Park bonds	.616	+.211	+.191	.451	+.240	+.218

1988-105 Toxic disclosure	.586	+.187	+.222	.453	+.204	+.239
1990-117[p] Mountain lions	.748	+.016	+.023	.535	+.074	+.089
1990-128 ''Big Green''	.673	+.249	+.265	.491	+.311	+.340
1990-130 Forests	.715	+.193	+.197	.514	+.277	+.293
1990-132 Gill nets	.697	+.069	+.074	.427	+.075	+.084
1994-180[p] Park bonds	.733	+.159	+.197	.535	+.229	+.277
1994-185 Public transit	.738	+.165	+.174	.493	+.200	+.240
1990-135 Counter to 128	.740	+.056	+.060	.447	+.132	+.138
1990-138 Counter to 130	.655	+.150	+.149	.478	+.193	+.216
Combined	.715	+.128	+.142	.466	+.195	+.219

NOTE.—The first column reports the $\bar{R}^2$ for the regressions in Table 3. The next two columns show how much the $\bar{R}^2$ rises when an ideology variable is added. The first ideology variable is the percentage of voters who are registered Democrats, and the second is the percentage of vote received by the Democratic presidential candidate in the most recent election. ''Combined'' is the total explained variation over all 16 initiatives; we report R^2 rather than $\bar{R}^2$ for this measure. ''Classification Accuracy'' is defined in the text; roughly speaking, it is one minus the sum of absolute deviations from a full model divided by the sum of absolute deviations from an intercept-only model.

account for a dominant proportion of the variation in voting, but ideology variables retain some explanatory power.

There is still variation to be explained after including the ideology variables. We might wonder if the unexplained variation is due to unmeasured ideological factors. In order to get a sense of how likely a possibility this is, Table 7 reports the correlation in county residuals across the 16 measures. These are the residuals from the regressions that include the presidential vote ideology variable. If a latent variable is present, we expect to see a positive correlation in residuals across the proenvironment initiatives and a negative correlation with the counterinitiatives. This is a weak test because the presence of correlation could be evidence of an unmeasured nonideological variable, but it has some power in that the absence of the expected correlations would be problematic for the ideology interpretation.

Whether Table 7 supports the latent variable hypothesis is perhaps in the eye of the beholder. Considering only the proenvironment measures, a simple count reveals that 73 of 91 correlations are positive, but only 11 are greater than 0.50. The average is 0.26. With 57 observations, a correlation of 0.22 is different from zero at the 10 percent level of significance; 52 correlations pass this test. The highest correlations are clustered in 1990, which suggests that voters may have viewed these initiatives as a package. If the 1990 propositions are treated as a single draw, there is relatively little significant correlation left. The residual correlation between the proenvironment measures and the counterinitiatives is positive in 14 of 28 cases, with an average of -0.02. Six of them are significantly negative at the 10 percent level. One can take the correlations as supporting an ideology interpretation for the residual variance, but the strength of the effect is not overwhelming, and it is equally plausible to hypothesize that there is an unmeasured latent price variable. We shall leave it to the reader to draw his or her own conclusion.

The results in this section are somewhat related to the vast literature on shirking and ideology in legislatures (see the special June 1993 issue of *Public Choice* for an overview). The literature has focused on two questions: (1) do legislators represent constituent interests, and (2) do constituent interests have an ideological as well as conventional economic component? Our paper has nothing to say about the first question, but there is strong evidence that legislators by and large vote their constituents interests.[40] It remains an open question, however, to what extent these interests

[40] John R. Lott, Jr., and Michael L. Davis, *A Critical Review and an Extension of the Political Shirking Literature*, 74 Pub Choice 461 (1992); and John R. Lott, Jr., and Stephen G. Bronars, *Time Series Evidence on Shirking in the U. S. House of Representatives*, 76 Pub Choice 125 (1993).

TABLE 7

CORRELATION OF COUNTY RESIDUALS ACROSS INITIATIVES

Initiative	1972 -9[p]	1972 -20	1974 -17	1982 -11	1982 -13	1986 -65	1988 -70[p]	1988 -105	1990 -117[p]	1990 -128	1990 -130	1990 -132	1994 -180[p]	1994 -185	1990 -135	1990 -138
1972-9[p]	1.00															
1972-20	.07	1.00														
1974-17	.24	−.02	1.00													
1982-11	.16	−.07	−.16	1.00												
1982-13	.28	−.08	.10	.26	1.00											
1986-65	.38	.09	.36	.24	.55	1.00										
1988-70[p]	.34	−.14	−.21	−.06	−.16	−.25	1.00									
1988-105	.61	.04	.05	−.03	.11	.31	.29	1.00								
1990-117[p]	.45	.19	−.22	.18	.09	.23	.45	.60	1.00							
1990-128	.42	.12	−.07	.09	.34	.30	.34	.41	.67	1.00						
1990-130	.34	−.01	−.16	.14	.21	.10	.47	.24	.72	.84	1.00					
1990-132	.36	.19	−.36	.41	.22	.15	.26	.23	.55	.58	.62	1.00				
1994-180[p]	.25	.27	−.28	.06	.43	.35	.15	.28	.51	.46	.37	.49	1.00			
1994-185	.28	−.07	−.31	.29	.40	.10	.33	.14	.43	.43	.48	.57	.50	1.00		
1990-135	−.04	−.28	−.25	.35	.07	−.25	.20	−.14	−.08	.08	.12	.29	.05	.16	1.00	
1990-138	−.06	.22	.08	−.07	.13	.14	−.07	.10	−.21	−.26	−.57	−.26	.03	−.11	.01	1.00

NOTE.—The residuals were generated from logistic weighted least squares voting regressions using the independent variables in Table 3 and an ideology variable equal to the fraction of votes received by the Democratic candidate in the most recent presidential election.

include ideology. There are a number of suggestive studies showing that interest group ratings predict roll call votes, but virtually no compelling direct evidence that ideology is an important part of constituent interests. For example, Kau and Rubin estimate a regression showing that congressmen who vote conservatively receive more votes when they run in a conservative district, as measured by the district's vote for Ronald Reagan in the 1980 presidential election; but they do not report the marginal explanatory power of this variable relative to their measures of constituent economic interests.[41] We do not have a general answer to the second question, but our results suggest that ideological motivations take a backseat to economic interests for most voters when it comes to environmental legislation.

V. Conclusion

The purpose of this article is to apply conventional economic analysis to the study of environmental demand. We focus on ballot propositions as a way to avoid the limitations of other techniques commonly used to study environmental demand, such as contingent valuation and hedonic pricing. Because the study of ballot propositions has its own set of limitations, we view our findings as complementary to those from studies employing other techniques.

Cross-county voting regressions are estimated for 16 environmental initiatives in the state of California between 1970 and 1994. These initiatives concerned a wide variety of issues. The explanatory variables in each regression are income and several variables that are plausibly correlated with the anticipated pecuniary costs of the proposed measures.

Across a wide range of issues, the environment appears to be a normal good for people with the mean level of income. However, certain environmental goods, particularly parks, appear to be inferior for people with high incomes. This may be because the wealthy are able to purchase such goods privately and thus do not favor increased public provision. The estimates also suggest that the ''price'' of increased provision of environmental amenities is paid by people employed in natural resource industries such as farming and forestry in particular and by less educated workers in general. Those people who do not bear the cost, apparently workers in jobs requiring high levels of education, consequently are more likely to favor increased provision of environmental goods.

The findings sketch a picture of the political economy of the environment by identifying the economic interests that are at stake. Pressure groups play

[41] James B. Kau and Paul H. Rubin, *Ideology, Voting, and Shirking,* 76 Pub Choice 151 (1993).

a central role in the economic theory of regulation as developed by Stigler, Peltzman, and Becker.[42] Our estimates indicate which groups are important and suggest that they are somewhat stable across time and issues. Thus, it may be sensible to speak of an environmental ''movement'' in the sense of a general demand for environmental goods or a stable coalition of groups pushing for increased environmental amenities.

Finally, our estimates address the broader issue of whether economics is an appropriate way to study environmental demand. It is sometimes argued that the conventional economic (self-interest) assumption does not apply when it comes to the environment, instead that notions of the common good as reflected in ideology are dominant. We show that a small set of standard economic variables can account for the majority of the variance in county voting patterns. Furthermore, inclusion of a variables representing political ideology add relatively small amounts of explanatory power to the regressions. Whether people are ''truly'' motivated by ideology is beyond the scope of this article but our results suggest that little is lost by studying environmental demand as if it were any other economic good, that is, by focusing on price and income effects.

APPENDIX

Content of Initiatives

June 1972: Proposition 9—Pollution Omnibus

This proposition was the most sweeping piece of environmental legislation proposed up to that time and has been called the first environmental initiative. It provided for removal of lead from gasoline sold in the state, authorization for the state to close businesses that violated air pollution standards, banning of certain pesticides (DDT, DDD, chlordane), limits on diesel fuel, a 5-year ban on construction of nuclear power plants, and a ban on new offshore oil drilling. The legislative analyst estimated the cost of the measure to be between $200 million and $770 million over 30 years from lost offshore lease revenues, and $5 million per year from onshore revenues. The initiative was sponsored by the People's Lobby and Ralph Nader; it was opposed by oil companies, utilities, Teamsters, and the California Manufacturers Association. Most environmental organizations, including the Sierra Club and Audubon Society, remained neutral.

Prices.—Pesticide restrictions would hurt farmers, and air quality standards, gasoline reformulation, and pesticide regulations would hurt manufacturers.

November 1972: Proposition 20—Coastal Zone Conservation

This measure proposed to create six regional coastal zone commissions and a state commission, shift jurisdiction over coastal development from local govern-

[42] George J. Stigler, *The Theory of Economic Regulation,* 2 Bell J Econ & Mgmt Sci 3 (1971); Sam Peltzman, *Toward a More General Theory of Regulation,* 19 J Law & Econ 211 (1976); and Becker (cited at note 36).

ments to the commissions, and severely restrict coastal development for 3 years while the commissions formulated master plans. The legislative analyst predicted a cost to taxpayers of $1.25 million per year. The measure was supported by the California Coastal Alliance, Planning and Conservation League; Sierra Club; League of Women Voters; University of California student government; and National Council of Senior Citizens. It was opposed by the California Chamber of Commerce, California Manufacturers Association, California Real Estate Association, Teamsters, and other building, construction, and fishermen's organizations.

Prices.—Development restrictions would hurt the construction industry, forestry workers might be hurt if logging restrictions were adopted, and manufacturers were listed as an opposition group. Northern interests might be favored by the transfer of development control away from state government, to the extent that southern interests were relatively influential in the capital. Likewise, farmers might lose if they were relatively influential in the state government.

November 1974: Proposition 17—Stanislaus River Protection

This measure called for a halt in construction of the New Melones Dam on the Stanislaus River near Yosemite Park. The purpose of the dam was to store irrigation water and produce electricity. Because the dam was a federal project, the initiative was advisory, but it was expected that the project would be canceled if a majority voted yes. The most visible supporters were a collection of conservation groups that wanted to preserve the river for whitewater recreation; opponents included the Army Corps of Engineers.

Prices.—Water rights involve the conflicting claims of farmers and city dwellers, north and south.

November 1982: Proposition 11—Bottle Deposit

This statute mandated a 5 cent refund on all beer and soft drink containers sold in the state. It was supported by the Sierra Club, consumer groups, the Teamsters, the Retail Clerks Union, and the California Farm Bureau Federation (over concern about damage to tractor tires and the cost of cleaning rural litter) and opposed by brewers and soda companies, glass and can container manufacturers, and the California Grocers Association.

Prices.—Farmers were on record in support and manufacturers were on record against; north-south differences might reflect a greater spread of the private and public recycling industry in the north.

November 1982: Proposition 13—Water Conservation

This statute proposed new water conservation standards and contained sections to protect streams and lakes and impede the use of the New Melones Dam. The measure was expected to have the greatest impact on farmers, by forcing them to conserve water. It was supported by conservation groups, who argued that the measure would create jobs by using water more efficiently and encouraging construction of water conservation facilities. It was opposed by the Agricultural Council, California Farm Bureau, Western Growers Association, Cattleman's Association, California Chamber of Commerce, and water agencies.

Prices.—The construction industry stood to benefit from creation of new jobs; farmers were on record in opposition; manufacturers might win or lose depending

on the extent of their business with the construction and farm industries; water involves cities and regional interests.

November 1986: Proposition 65—Toxic Disclosure

This statute aimed to prohibit businesses from releasing chemicals that cause cancer or reproductive disorders into sources of drinking water and required businesses to warn customers about potentially toxic chemicals in their products. Public agencies, such as power plants, sewage systems, and water systems, were exempted from the requirements. Farmers were concerned that certain fertilizers and pesticides would be banned and that they would be forced to prove that others did not cause cancer. Manufacturers were concerned about the cost of labeling products. The measure was supported by environmental organizations and opposed by the oil, chemical, and agriculture industries.

Prices.—Farmers and manufacturers were on record in opposition; public agencies, typically in cities, were exempted.

June 1988: Proposition 70—Park Bonds

This statute authorized a $776 million bond issue to acquire wildlifelands and parklands and develop, rehabilitate, protect, and restore existing parklands. It was supported by the Planning and Conservation League and other conservation organizations. Opposition included the California Farm Bureau Federation. Rural interests were concerned that over 90 percent of the money could be spent on new acquisitions, particularly for parks in cities. Opponents also complained that the measure earmarked specific expenditures to satisfy special interests.

Prices.—Construction and manufacturing industries might be hurt by development restrictions; farmers were on record in opposition; costs might rise in the timber industry as forest land is taken out of production; expenditure for city parks benefits urban dwellers; the regional dummy might capture north-south variations in earmarked funds.

November 1988: Proposition 105—Toxic Disclosure

The main environmental feature of this initiative was a requirement that businesses warn the public if their consumer products were toxic. It also required insurance companies to disclose certain information about their policies in relation to Medicare, required nursing homes to disclose to their consumers certain information about past care, contained clauses to make it clear which groups were sponsoring political campaigns, and required companies to disclose if they did business in South Africa. The measure was supported by a coalition of consumer groups, environmentalists, and senior citizens under the name of Consumers United for Reform (CURE). Organized opposition was minimal.

Prices.—The construction, farming, and manufacturing industries might be adversely impacted by toxic disclosure regulations.

June 1990: Proposition 117—Mountain Lion Protection

This proposition banned the hunting of mountain lions, created a fund to acquire and restore wildlife areas and wetlands, and allocated $30 million a year to the fund for 30 years. The money was to be drawn from existing tobacco tax revenues. Purchases were specifically designated for the Santa Monica mountains, Santa Lucia

mountains near Monterey city, Lake Tahoe, and coastal conservation. The measure was supported by the Planning and Conservation League and other conservation groups. It was officially opposed by the San Joaquin Chapter of the Wildlife Society on the grounds that it would divert environmental resources from truly needy programs and by sportsmen who disputed how many lions were left.

Prices.—The costs of this measure arose from the wildlife and wetlands funds, not preservation of the mountain lions per se; the issues are then similar to those for 1988-70.

November 1990: Proposition 128—''Big Green''

The feature of this proposition that received the most attention was a ban on the use of pesticides that cause cancer or reproductive harm. The legislative analyst estimated this would eliminate 350 out of the 2,300 chemicals in use. The measure also proposed to reduce the emission of greenhouse gases by 40 percent (it did not specify how), provided for $300 million in bonds to buy redwoods, prohibited new offshore oil-drilling, tightened water quality standards, and established an elected state environmental advocate. The total cost to all levels of government was estimated by the legislative analyst to be about $110 million per year. The initiative was supported by environmental groups, including the Sierra Club, National Wildlife Federation, California League of Conservation Voters, and Natural Resources Defense Council. It was opposed by the chemical, oil, timber, and agriculture industries as well as the California Taxpayers Association, California Chamber of Commerce, and California Manufacturers Association.

Prices.—This measure affected pesticides, water, and parks and thus involved the entire range of interests.

November 1990: Proposition 130—Forest Preservation

The main features of this measure were a ban on clear-cutting of forests, authorization of a $742 million bond issue to purchase old-growth redwood forests (especially Headwaters Grove in northern coastal California), and restriction of industry membership on the state Board of Forestry that regulates logging. The legislative analyst estimated it would cost $55 million per year for 20 years to repay the bonds. The proposition was supported by a coalition of environmental groups and opposed by the timber industry.

Prices.—The construction industry might be hurt by rising wood prices; and the farming, forestry, and manufacturing industries were officially opposed; none of the restrictions would apply in urban areas; and the north dummy might pick up the fact that the redwoods are concentrated in the northern part of the state.

November 1990: Proposition 132—Gill Net Ban

This measure proposed to ban the use of gill nets for commercial fishing. At the time of the election, gill net fishing was already prohibited along the coast of Northern California. It was supported by sports fishermen and conservation groups who disliked the indiscriminate nature of gill net fishing, which occasionally kills dolphins and other marine animals. It was opposed by commercial fishers and fish processors, who argued it would cost jobs in food manufacturing.

Prices.—Manufacturers were threatened with lost jobs; the ban would make a difference only off the coast of southern California.

NOVEMBER 1990: PROPOSITION 135—COUNTERINITIATIVE TO 128

This measure proposed to increase the state's monitoring of pesticide residuals on food and require the state to collect and dispose of pesticides that could not be used; the cost of both services was to be shifted to the state from the processors. The legislative analyst estimated startup costs of $35 million and annual costs between $7 and $13.5 million. The initiative was supported by agriculture, food processors, and grocers and opposed by environmental groups including the Sierra Club, California League of Conservation Voters, and Natural Resources Defense Council.

Prices.—Farmers and pesticide and food manufacturers stood to gain from the pesticide regulations.

NOVEMBER 1990: PROPOSITION 138—COUNTERINITIATIVE TO 130

This measure proposed to modify the way the state granted logging permits, generally to the advantage of timber companies, prohibit the state from forcing sale of forests for 10 years, and called for but did not authorize a $300 million bond issue for forest restoration. The legislative analyst estimated the bonds would cost $22 million per year for 20 years. This initiative had the form of a restriction on clear-cutting, but in effect would have made such logging easier; effectively it would have nullified Proposition 130 if it received more votes. It was supported by the timber industry and opposed by most environmental groups including the Sierra Club, Audubon Society, Natural Resources Defense Council, Planning and Conservation League, and Defenders of Wildlife.

Prices.—This involved the same interests as Proposition 1990-130.

JUNE 1994: PROPOSITION 180—PARK BONDS

This measure authorized a bond issuance of nearly $2 billion. The money would be spent to acquire, develop, and conserve parklands, historic sites, and wildlife and natural areas. It was similar to Proposition 170 on the 1988 ballot. The initiative was supported by the National Audobon Society, California Nature Conservancy, California Park and Recreation Society, Planning and Conservation League, and Save the Redwoods League. It was also supported by the police chief of Los Angeles and other law enforcement organizations, who argued that higher spending on parks would make urban neighborhoods safer. The main opposition was taxpayer groups.

Prices.—This involved the same interests as 1988-70.

NOVEMBER 1994: PROPOSITION 185—PUBLIC TRANSPORTATION, GAS TAX

This initiative proposed to increase the gas tax by 4 percent. The proceeds would be used for electric rail and clean buses; light rail, commuter, and intercity rail systems; and wetlands, riparian habitat, and parks. Priority was given to high-speed rail along the Los Angeles–San Francisco corridors and transit services in the Yosemite and Lake Tahoe areas. The measure was sponsored by the Planning and Conservation League, who also sponsored Proposition 180 on the June 1994 ballot. Its supporters included the Congress of California Seniors, the Coalition for Clean Air, Citizens for Reliable and Safe Highways, and the California Public Interest Research Group. Opponents included various taxpayer groups and members of the

California Transportation Commission, the California Highway Users Conference, and the California Business Alliance.

Prices.—The construction and manufacturing industries might be hurt by reductions in highway construction; public transit would be used by city dwellers and not farmers; the projects were concentrated in the north.

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