VOTER PREFERENCES AND STATE REGULATION OF SMOKING

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Voters' preferences for smoking restrictions in restaurants, bars, malls, indoor sporting events, and hospitals are consistent with state-level restrictions on smoking in each of these public areas. This analysis is based on constructed measures of political pressure that take into account both individual preferences and voting behavior. Although smokers are less likely to vote than nonsmokers, their lower voting rate does not substantially influence the probability that a state has a restriction. Other factors, such as tobacco's role in the state economy and state income, are rarely influential. (*JEL* H70, I18, K32)

I. INTRODUCTION

Tobacco taxation and smoking restrictions are two areas of regulation for which states have maintained a high level of control relative to the federal government.[1] Given this flexibility, states have established a wide range of restrictions on smoking in areas such as government workplaces, restaurants, bars, shopping malls, indoor arenas, and hospitals.[2] Although most states restrict smoking in hospitals, there is considerable variation among states in restrictions in other areas. In the 1998–99 period of this study, about two-thirds of states restricted smoking in restaurants, whereas only four states restricted smoking in bars.

What has led to variation in smoking restrictions across states? In a democratic society one would expect voter preferences to play an instrumental role in determining which policies are enacted and which are not. This article provides the first empirical exploration of whether state-level smoking restrictions are consistent with preferences of the citizenry, taking into account both voting behavior and the role of smoking status in influencing whether an individual votes. Specifically, we examine whether voters' preferences for smoking restrictions in restaurants, bars, malls, indoor sporting

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1. Federal involvement in tobacco regulation has been isolated to a few areas. It has had a primary role in investigating and reporting the health consequences of tobacco use and in establishing restrictions on advertising and labeling requirements. Congress has also passed laws specifying restrictions on smoking on domestic flights and in facilities that serve children and receive federal funding. If states do not institute certain laws and enforce those laws to decrease smoking and tobacco use among minors, they face significant reductions in the Substance Abuse Prevention and Treatment block grant. See www.samhsa.gov/csap/SYNAR/sydex.htm for details.

2. There are numerous local laws imposing smoking restrictions. Local laws that are perceived as successful can lead to widespread adoption, and economic interests may also be influential. Once local laws are enacted, affected enterprises may press for state regulation to avoid losing patrons to nearby cities. See "Smoke-Free, Statewide," *Boston Globe*, 11 May 2003, p. 10. On the other hand, 17 states have some level of preemption of local indoor smoking laws, which forbids lower-level jurisdictions from passing laws more stringent than those set at the state level or simply forbids any different local laws. We address only state-level restrictions in this article, leaving for future research the important question of interactions between state and local restrictions.

ABBREVIATIONS

CPS: Current Population Survey
EPA: Environmental Protection Agency
ETS: Environmental Tobacco Smoke
GSP: Gross State Product
MIS: Month In Sample
OSHA: Occupational Safety and Health Administration

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events, and hospitals are consistent with state-level restrictions on smoking in each of these public areas.[3] Our research draws on public choice models of policy making by state and local governments. Voters' preferences typically play a central role, because voting affects legislators' incentives to support regulations.[4] Public choice research also finds that nonvoter factors may influence state and local policy making.[5] In the case of smoking regulations, public health advocates or tobacco industry lobbyists might influence regulatory policies.

The specific building block of our analysis of state restrictions on smoking is information on individuals' voting behavior, which we link to their smoking status and preferences over smoking restrictions. Our analysis uses measures of political pressure that account for individual preferences as well as their voting behavior. To examine the possible role of interest group pressures, we also control for nonvoter influences on smoking regulation, including the proportion of the state population who smoke, measures of state ideology, and size of the tobacco industry.

With the exception of smoking in bars, there is majority support for smoking restrictions. Unsurprisingly, smokers are less supportive of restrictions than are nonsmokers. Nonetheless, even smokers demonstrate a high level of support for many restrictions. Smokers are also less likely to vote than are nonsmokers, even after controlling for other demographic factors. The lower voting rate diminishes voter opposition to antismoking regulation but is usually not critical in view of the substantial support that most smoking restrictions have among smokers. The political pressure indices for restrictions on smoking in each public area are generally significantly related to the probability that a state restricts smoking in that public area. The nonvoter factors, such as the smoking rate in the state and tobacco's role in the state economy, are rarely influential.

Policy debates over the desirability of smoking restrictions emphasize possible health risks due to exposure to environmental tobacco smoke (ETS) and effects on business profitability. The primary argument for expanding smoking restrictions is to protect workers and customers from exposure to ETS.[6] As our results show, voters are generally supportive of smoking restrictions in public areas, which would thereby protect workers as well as themselves and other customers. However, there is a substantial controversy over the extent of health risks associated with exposure to ETS. The basis for the push by the U.S. Occupational and Safety Health Administration (OSHA) for increased smoking restrictions to protect workers is the highly controversial U.S. Environmental Protection Agency (EPA) (1992) study on environmental tobacco smoke.[7] Survey evidence indicates that respondents perceive risks of ETS far in excess of those reported in the scientific literature.[8] To the extent that voters' preferences for smoking restrictions

3. Studies that have examined the political economy of other types of smoking policies include Hunter and Nelson (1992), Besley and Rosen (1998), and Nelson (2002), who empirically investigate the determinants of cigarette tax rates. Jacobson et al. (1993) examine the evolution of antismoking legislation using six states as case studies.

4. See Inman (1987) for an overview of political economy models of policy making.

5. Stigler (1971), Peltzman (1976), and Becker (1983) have modeled the role of political pressures from interest groups. In many empirical studies, nonvoter variables add explanatory power to the determination of public spending. Ahmed and Greene (2000) find interest group models perform about as well as median voter models in explaining local spending in New York State counties. Congleton and Bennett (1995) find support for both median voter and special interest models in the determination of state highway expenditures. Stanton and Whitehead (1994) find intergovernmental relations, state wealth, special interests, and other political variables are important determinants of states' air and water pollution control expenditures. Case et al. (1993) find a significant positive impact of neighboring states' spending on a state's chosen funding.

6. Regulations may also reduce smoking prevalence. The U.S. Department of Health and Human Services (2000) provides a comprehensive review of the large body of literature on the effect of smoking restrictions on individual smoking behavior. In a recent study, Evans et al. (1999) find that workplace smoking bans reduce smoking prevalence among workers subject to bans by more than 5 percentage points and reduce average cigarette consumption among those workers by about 10%.

7. The EPA's meta-analysis found a 19% increase in lung cancer risk to nonsmokers from exposure to ETS, significant at the 90% level, which translates into 3000 deaths per year. The methodology of the EPA study has been widely criticized and was the subject of a federal lawsuit (*Flue-Cured Tobacco Cooperative Stabilization Corporation v. United States Environmental Protection Agency*, 4 F.Supp.2d 435 [1998]). Recent research finds no effect of ETS on long-term mortality from tobacco-related disease (Enstrom and Kabat 2003). For a discussion of the role of the EPA report in OSHA's decision to classify ETS as a workplace hazard, see for example Karr and Gutfeld (1992).

8. Survey evidence for Spain, which has cigarette warnings and smoking risk beliefs comparable to those in the United States, is instructive. Spanish respondents believe that 25% of people exposed to ETS will get lung cancer and 25% will get heart disease, and that the average person will lose six years of life expectancy due to exposure to ETS. See Viscusi (2002, 120–21).

are governed by exaggerated beliefs rather than the lower risk estimates that have appeared in the scientific literature, the political support for these policies presumably is greater than it would be if decisions were more informed.

The principal costs of smoking regulations are the possible loss of profits to owners of bars, restaurants, and other businesses. Smokers themselves are generally supportive of most smoking bans, so presumably smokers do not find smoking restrictions overly burdensome. The evidence on whether smoking bans lower restaurant and bar profitability is mixed and may be transitory.[9] For example, in a survey of business owners following the passage of a comprehensive smoking ban in a California city, Boyes and Marlow (1996) found that 57% reported the ban had no impact on their business, 17% experienced a positive effect, and 25% a negative effect.

Evidence of voter support for these restrictions does not necessarily imply that voters have considered these pertinent cost and benefit components in forming their preferences. Moreover, the enactment of restrictions that have broad public support does not necessarily imply that there is a market failure. As Dunham and Marlow (2000a) found, private operators of restaurants and bars often institute nonsmoking sections voluntarily in response to the preferences of their customers. Employers likewise took considerable initiative in instituting smoking policies even before the wave of regulation. By 1991, 85% of all firms had implemented smoking policies, with 34% of these being bans and an additional 34% prohibiting smoking in all open work areas (see Viscusi 2002, 124). Some smoking restrictions have emerged even without government regulation.

Our results indicate that the smoking restrictions that have been adopted are in line with voter preferences and do not stem from power wielded by narrowly defined special interest groups. Furthermore, the broad support among individuals suggests that even in the absence of government regulation, private market incentives may likewise result in restrictions on smoking.

Our analysis of the determinants of state restrictions uses an innovative measure of voter preferences. We introduce two different measures of voter preferences, each of which is calculated using individual data. The predicted voter pressure index weights the preferences of voters by the expected probability that they will vote, which is the information that political officials can observe ex ante. The actual voter pressure index weights individual preferences by whether they actually did vote and serves as an ex post measure of voter preferences. The performance of these voter preference variables differed somewhat, but each of these variables was strongly predictive of most smoking restrictions.

II. THEORETICAL FRAMEWORK

A model of the relation between voter preferences and regulation serves as the framework for our analysis. Let R_j be a 0–1 indicator of whether a particular smoking restriction has been chosen by state j. We write the probability that state j has a particular smoking restriction, R_j, using the following equation:

$$(1) \quad \Pr(R_j = 1) = \rho(\alpha_1 + \alpha_2 r_j^* + X_j\alpha_3 + Z_j\alpha_4 + \alpha_5 S_j).$$

If state policy makers are responsive to voter preferences, then R_j will depend on r_j^*, which is a measure of preferences for smoking restrictions by voters in that state. This is the key variable in our analysis and will be defined using equations (2) and (3). The dependent variable focuses on regulations in place at a particular point in time, as do the measures of preferences. States established various regulations at different points of time, and an alternative approach might be to examine the influence of factors measured at the time the specific policy was adopted. However, most existing regulations were already in place before any data on individual preferences regarding smoking regulation were available. Therefore, our formulation is a test of the consistency of preferences with regulatory regimes rather than a test of which regulations will be adopted for the first time during that period.

9. Dunham and Marlow (2000b) critique the methodology of several studies that conclude that business profitability is not harmed by smoking restrictions. Their own study finds that owners expect a drop in revenue if laws banning smoking in these establishments were instituted, with owners of bars expecting larger losses than restaurant owners.

Smoking restrictions may also depend on a vector X_j of demographic variables that capture additional preference information not reflected by r_j^*. Variables representing the influence of interest groups and other political variables are given in a vector Z_j. The probability a state j has a smoking restriction might also depend directly on the smoking rate of the state, given by S_j. The smoking rate has two opposing effects. As the fraction of smokers rises, so does their political influence. However, a higher smoking rate will increase the costs incurred by nonsmokers and consequently may increase their support for smoking bans.

We analyze the consistency of regulatory policies with respect to two measures of voter preferences r_j^*. Our first measure focuses on the political pressure of expected voters. Politicians may not know the preferences of those who actually vote, but instead assess the distribution of preferences across the population and assign a corresponding probability of voting for each individual. The first component used in constructing this political pressure index is the voting probability for each individual i in state j based on the following form:

$$(2) \qquad \Pr(V_{ij} = 1) = \Phi(\beta_1 + Y_{ij}\beta_2 + \beta_3 S_{ij}),$$

where V is the 0–1 indicator of voting, and Y is a vector of characteristics, such as income and education that influence individual voting behavior. Smoking status of the individual is also included as a separate determinant of voting status.

We use the estimates from equation (2) to weight each individual's reported preference for a ban on smoking in that area. We then calculate the mean of this weighted preference variable within each state and use this variable as an index of voter pressure in support of regulation. Specifically, the predicted voter pressure index for state j is of the form:

$$(3) \qquad \hat{r}_j^* = \sum_{i=1}^{N_j} \hat{V}_{ij} p_{ij} \Big/ N_j,$$

where N_j is the number of observations in state j, $\hat{V}_{ij}$ is the predicted probability of voting of individual i in state j, and $p_{ij} = 1$ if individual i in state j supports banning smoking in the specified area and 0 otherwise.

Our second measure is based on the smoking regulation preferences of the people within a state who actually did vote. The state-level preference index of voters is the mean of the preference variable, p_{ij}, taken over all voters in the state. We refer to this measure as the actual voter pressure index.[10]

The two different voter pressure indices capture different mechanisms by which voter influence may be exerted. With the predicted voter pressure index, legislators assess the probabilities that different constituents will vote as well as the associated preferences of these individuals to calculate an expected political preference measure of constituents. The second measure is based on the assumption that legislators can identify the preferences of voters, or alternatively, people are voting directly on smoking policies. In the usual situation, voters are not considering narrowly defined smoking referenda, so that the legislator must form a probabilistic assessment of voters' expected preferences with respect to any type of policy.

III. INDIVIDUAL PREFERENCES FOR SMOKING REGULATIONS AND VOTING RATES

In this section we provide estimates of p_{ij} and $\hat{V}_{ij}$, which are used to construct the measures of voter pressure for regulation. We combine data from three waves of the Current Population Survey (CPS). The CPS is a nationally representative monthly survey of about 48,000 households. The basic monthly CPS survey provides detailed information on labor force activity and demographics. Supplements to the basic survey provide information on special topics. Voting information is available on the CPS November 1998: Voting and Registration Supplement. Information on smoking status and preferences over smoking restrictions is provided in the Tobacco Use

10. There was negligible variation in median voter preferences across states; consequently our analyses are based on state mean values. The median voters in all states preferred allowing smoking in some areas for bars, and they all preferred no smoking at all for hospitals, indoor sporting events, and malls. Only for smoking in restaurants was there any variation in median preferences across states. As we will describe in section III, the survey specified only three possible responses for reporting preferences over smoking restrictions. To test the median voter model, ideally we would measure individual support for smoking restrictions using a continuous scale. With a greater number of gradations we would also expect more variability in the median response by state, making a test of the median voter model feasible.

Supplement, which was conducted in conjunction with the CPS in September 1998, January 1999, and May 1999.[11]

The CPS sampling procedure makes it possible to link individuals' information reported in different months of the survey. Household members are interviewed for four consecutive months and then reinterviewed again for four consecutive months in the same period one year later. We can associate the smoking information from the September and January surveys to the voting information on the November survey for approximately half of the total number of respondents to the September and January surveys. Specifically, those whose month in sample (MIS) in September is 1, 2, 5, or 6 can be linked to their voting information in the November survey, when their MIS is 3, 4, 7, or 8; and likewise those with MIS 1, 2, 5, or 6 in November can be linked to their smoking responses in January when their MIS will be 3, 4, 7, or 8.[12]

The variables used in the analysis are defined as follows. Voting status is determined directly from the response to the November supplement question, "Did [respondent] vote in the election held on Tuesday, November 3?" Individual smoking status is determined by the response to the question of whether the individual currently smoked and was asked of all respondents (or their proxy) who reported smoking at least 100 cigarettes in their lives.

Attitudes toward smoking in public areas were elicited from a series of questions asking whether the respondent thought smoking in that public area should be allowed. Specifically, respondents were asked, "In [public area], do you think that smoking should be allowed in all areas, in some areas, or not allowed at all?" for each of the public areas of restaurants, hospitals, indoor work areas, bars and cocktail lounges, indoor sporting events, and indoor shopping malls.[13] There are consequently two possible break points that can be used to construct a 0–1 indicator variable for a respondent's support of smoking restrictions. Few respondents indicated that smoking should be allowed everywhere in each of the public areas. Three percent or less would impose no restrictions in each of the public areas other than bars, for which 29% of the sample favored no restrictions. Basing the voter preference variable on whether they believed smoking should not be allowed at all showed considerably more variability.

Our sample is comprised of respondents with smoking status reported. Only those age 18 and older are eligible to vote, so the sample is also restricted to those 18 or older as of the November survey. The resulting sample size is 63,576 observations with both smoking and voting status reported. However, missing values on other variables further reduce the sample size.

The primary source of missing information is preferences over regulations. The basic CPS requests information on all household members 15 years of age and older and allows proxy respondents to report information for unavailable household members. Proxy respondents were also asked to report the smoking status of unavailable household members, but only self-respondents were asked to report their preferences over regulations. Twenty-one percent of the observations were reported by proxy. Furthermore, some self-respondents failed to answer some preference questions. We restrict the sample

11. This supplement was sponsored by the National Cancer Institute and is similar to the Tobacco Use Supplement surveys conducted in 1992–93 and 1995–96. Ideally one would analyze the evolution of regulation between survey waves, but too few states changed their regulations between 1993 and 1999 to permit analysis of changes in regulatory status. We are not able to use data from the May 1999 wave because it is not possible to link information from this survey to voting status reported in the November 1998 wave.

12. It is not possible to link all such respondents because household members are not followed to their new residence if they move. Instead, the new occupants of the residence are surveyed. To match the same individual across surveys, we use information on household identifier, individual-specific identifier, and household number (CPS variables *HHID*, *LINENO*, and *HHNUM*). The latter number is assigned 1 for the original household and will increment by 1 when a household is replaced. Thus, individuals are matched if all of these variables are the same in both surveys. In theory, matching on these three variables should be sufficient to avoid mismatches, but in practice various recording errors occur (see, e.g., Madrian and Lefgren 2000). We use four additional criteria. First, we require that MIS differs by 2 in matching the smoking information to the voting information, so that individuals who are surveyed for the first time in September are being surveyed for their third time in November, and so forth. We also require that individuals match on sex and on race and that age changes in the later survey by no more than one year.

13. For convenience, we refer throughout the paper to indoor shopping malls as "malls" and bars and cocktail lounges as "bars."

TABLE 1
Mean Preferences for Smoking Bans, by Voting and Smoking Status

Place of Smoking Ban	All Respondents	Voters	Voters—Smokers	Voters—Nonsmokers	Nonvoters	Nonvoters—Smokers	Nonvoters—Nonsmokers
Restaurants	0.514	0.545	0.207	0.608	0.483	0.203	0.589
Bars	0.292	0.312	0.080	0.356	0.271	0.072	0.347
Malls	0.690	0.706	0.487	0.747	0.674	0.503	0.740
Indoor sporting events	0.726	0.752	0.554	0.789	0.700	0.538	0.762
Hospitals	0.822	0.834	0.655	0.868	0.809	0.669	0.863
Indoor work areas	0.675	0.702	0.439	0.751	0.649	0.416	0.738
Number of observations	47,798	23,796	3,744	20,052	24,002	6,605	17,397

to self-respondents who do not have missing values on any of the six preferences regarding smoking limitations. This results in a sample of 47,798 individual observations.

Table 1 examines how preferences over restrictions vary by voting and smoking status. Overall, respondents are generally supportive of banning smoking in public areas. The largest support for a smoking ban is for hospitals, with 82% of the sample favoring no smoking in hospitals, and the weakest support is for smoking bans in bars, with only 29% in favor of prohibiting smoking entirely. The remaining preferences all exceed 50% in favor of no smoking: 51% for restaurants, 68% in indoor work areas, 69% for malls, and 73% for indoor sporting events.

As Table 1 demonstrates, preferences vary by both smoking and voting status. Voters are more supportive of smoking restrictions than are nonvoters, but the differences are not great. For instance, 55% of voters favor banning smoking in restaurants, and 48% of nonvoters do. Smokers who do not vote exhibit preferences that are similar to those of smokers who do vote. The largest differences among individuals are by smoking status. In every instance, voting smokers are considerably less supportive of regulations than are voting nonsmokers. For example, 61% of voting nonsmokers favor smoking bans in restaurants, in contrast to only 21% of voting smokers.

Based on the statistics in Table 1, smokers comprise just under 16% of the voting population. What percentage of the voting population must smokers make up to have a majority of voters oppose the ban? For restaurant bans, that critical level is 27%, whereas for malls it is 95%. Irrespective of the mix of smokers and nonsmokers among the voting population, restrictions for bars lack majority support, and restrictions for indoor sporting events, hospitals, and indoor work areas have majority support.

To derive the predicted voter pressure index, we begin by estimating the voting equation specified in equation (2). In addition to smoking status and attitudes, our voting probability equation also controls for family income, years of education, region, metropolitan residence, age, marital status, sex, race, and ethnicity. Family income is reported in 14 categories ranging from less than $5000 per year to more than $75,000 per year. Family income is missing for 9% of the sample; we include these observations in the analysis with an indicator for missing values. For convenience, we assign the midpoint of the category to create a continuous variable, imputing $80,000 to the top open-ended category. The results are similar whether our estimates are based on the categorical family income measure or the imputed continuous measure. Marital status is grouped into three categories of married, never married, or previously married (divorced, separated, widowed). We include an indicator variable equal to 1 if race is white and another variable equal to 1 if the respondent is Hispanic.

The sample means of the variables used in the analysis are reported in the first column of Table 2. The sample voting rate is 50%, and 22% of the respondents are smokers. The sample has fewer men than in the population overall in part because the restriction to self-respondents reduced the share of men who directly answer the survey.[14]

The last two columns of Table 2 present the estimated effect of these variables on the probability of voting. The dependent variable is equal to 1 if the individual voted in the November 1998 election and is 0 otherwise.

14. Without the restriction to self-respondents, the male share is 46.3%.

TABLE 2
Individual Determinants of Voting (Dependent Variable: Voted in November 1998 Election)

Variable	Mean (SD)	(1)	(2)
Voter (dependent variable)	0.50 (0.50)		
Smoker	0.217 (0.412)	−0.217** (0.016) [−0.086]	−0.222** (0.015) [−0.088]
Family income (×1000)	41.62 (24.57)	0.006** (0.0003) [0.002]	0.006** (0.0003) [0.002]
Family income missing	0.08 (0.27)	0.113** (0.026) [0.045]	0.112** (0.026) [0.045]
Education	13.12 (2.91)	0.092** (0.002) [0.037]	0.093** (0.002) [0.037]
Male	0.43 (0.49)	−0.032** (0.013) [−0.013]	−0.034** (0.013) [−0.014]
Age	46.71 (17.18)	0.027** (0.0004) [0.011]	0.027** (0.0004) [0.011]
Married	0.61 (0.49)	0.111** (0.018) [0.044]	0.111** (0.018) [0.044]
Previously married	0.21 (0.41)	−0.173** (0.022) [−0.069]	−0.173** (0.022) [−0.069]
Northeast	0.21 (0.41)	−0.177** (0.018) [−0.070]	−0.179** (0.019) [−0.071]
Midwest	0.25 (0.43)	0.021 (0.018) [0.009]	0.020 (0.018) [0.008]
South	0.31 (0.46)	−0.194** (0.017) [−0.077]	−0.200** (0.017) [−0.079]
White	0.87 (0.33)	0.013 (0.019) [0.005]	0.014 (0.019) [0.006]
Hispanic	0.07 (0.25)	−0.359** (0.027) [−0.140]	−0.360** (0.027) [−0.141]
Restaurant ban	0.51 (0.50)	0.021 (0.017) [0.008]	
Bar ban	0.29 (0.45)	−0.056** (0.016) [−0.023]	
Mall ban	0.69 (0.46)	−0.023 (0.019) [−0.009]	
Indoor sporting events ban	0.73 (0.45)	0.032 (0.019) [0.013]	

continued

TABLE 2
Continued

Variable	Mean (SD)	(1)	(2)
Hospital ban	0.82	0.039*	
	(0.38)	(0.020)	
		[0.016]	
Indoor work area ban	0.68	0.005	
	(0.47)	(0.017)	
		[0.002]	
Constant		−2.626**	−2.584**
		(0.047)	(0.045)
Pseudo *R*-squared		0.14	0.14
Log likelihood		−28,594.64	−28,605.16
Number of observations	47,798	47,798	47,798

Notes: Table reports probit coefficients with standard errors in parentheses and marginal effects in brackets. The dependent variable equals 1 if the individual voted in the November 1998 election, and 0 otherwise. ** (*) indicates coefficient is significantly different from zero at 1% (5%) level, two-sided tests.

Because the decision to vote is dichotomous, we use probit regression. Attitudes regarding smoking in public areas are included in equation (1), whereas equation (2) omits these measures. We report the original probit coefficients and the associated asymptotic standard error (in parentheses), as well as estimates (in brackets) of the marginal effect of a change in each of the explanatory variables.

The regression results in Table 2 indicate that individuals with higher income, with higher education, who are older or married, are more likely to vote, and men, those previously married, or those residing in the Northeast or South (relative to the West) are less likely to vote. Attitudes regarding smoking in public areas add little explanatory power to the voter equation, although two of the attitudes measures have statistically significant coefficients. Support for banning smoking in hospitals increases the voting rates, but support for restrictions in bars decreases the voting rate. The other four preferences do not have a significant effect on voting. Attitudes toward smoking restrictions consequently do not generate systematic efforts to vote in an effort to support or oppose smoking restrictions.

The principal result in Table 2 is that smokers are considerably less likely to vote than nonsmokers, even controlling for other important determinants of voting status, such as income and education, which are correlated with smoking. Smokers have a 0.09 percentage points lower probability of voting, all else equal. Policy makers consequently may be less responsive to smoker preferences because smokers tend to vote with lower frequency than do nonsmokers, controlling for other key variables. The means in Table 1 show that smokers, not surprisingly, are less favorable toward banning smoking in public areas, and the means indicate that voter preferences are more heavily weighted toward nonsmoker preferences. The latter is caused in part by the lower voting rates of smokers. Whether these different voting rates of smokers and nonsmokers matter in terms of smoking policy choice depends on whether voter preferences influence states' chosen smoking restrictions, which we now address.

IV. STATE SMOKING RESTRICTIONS

Data on state (including the District of Columbia) smoking restrictions are reported in the State Tobacco Activities Tracking and Evaluation (STATE) System, which is an online source of current and historical information on state tobacco control laws and other economic and behavioral information on smoking and other tobacco use in states.[15] For each state, the site provides the enactment

15. The STATE system can be found online at www2.cdc.gov/nccdphp/osh/state/. The system was developed by the Centers for Disease Control and Prevention, Office on Smoking and Health, National Center for Chronic Disease Prevention Health Promotion, and it is updated quarterly using legislative databases.

TABLE 3
Prevalence of State Smoking Restrictions January 1999

Place of Regulation	Number of States with Type of Restriction				
	No Restriction	Separate Smoking Areas[a]	Separate Ventilation[b]	No Smoking	Any Smoking Restriction
Restaurants	20	28	0	3	31
Bars	47	3	1	0	4
Malls	43	6	1	1	8
Enclosed arenas	28	21	1	1	23
Hospitals	8	35	2	6	43

[a]Designated smoking areas required or allowed.
[b]Designated smoking areas allowed if separately ventilated or no smoking without separate ventilation.

and effective dates of the most recent legislation, if any, restricting smoking in various indoor areas as well as details about the type of restriction.[16] Restrictions are broken down into four categories in order of stringency: no restrictions, designated smoking areas, separate ventilation requirements, and smoking bans. Given the dates of the CPS Tobacco Use Supplement preference data for 1998–99, we analyze restrictions as of 31 January 1999.[17]

Table 3 reports the number of states that have smoking restrictions in restaurants, bars, malls, enclosed arenas, and hospitals. The most common policy is restricting smoking in hospitals, with 43 states having some smoking restriction. Hospitals also have the most variation in the stringency of smoking restrictions, with six states banning smoking in hospitals entirely, and eight states having no restrictions in hospitals. Designated smoking areas are the most common requirement for restaurants and enclosed arenas, required in restaurants in 28 states and in enclosed arenas in 21 states. At the other extreme, only four states restrict smoking in bars and eight states restrict smoking in malls.

Tables 4 and 5 provide descriptive statistics for other state-level data used in the regressions. The smoking rate, S, in each state was found from the CPS Tobacco Use Supplement.[18] On average across all states, about one in five adults are smokers, but there is considerable variation in smoking rates for states, with a range of 13.2% to 32.2%. Other variables were chosen to match the vectors X and Z from equation (1) of the model. We proxy X by real median household income. A positive income elasticity for increased

TABLE 4
Descriptive Statistics for State Data (State Characteristics)

Variable	Mean (SD)
Smoking rate	0.218 (0.030)
Median income/10,000	3.853 (0.572)
Percent GSP from tobacco	0.263 (0.899)
Republican governor/state legislature	0.255 (0.440)

TABLE 5
Descriptive Statistics: State Voter Pressure Indices

Area of Smoking Ban	Predicted Voter Pressure Index, Mean (SD)	Actual Voter Pressure Index, Mean (SD)
Restaurants	0.268 (0.043)	0.537 (0.074)
Bars	0.155 (0.021)	0.305 (0.045)
Malls	0.353 (0.052)	0.708 (0.075)
Indoor sporting events	0.377 (0.054)	0.759 (0.071)
Hospitals	0.414 (0.047)	0.834 (0.047)

16. There is also information about exceptions, enforcement, and penalties.
17. Extending the cut-off date to 30 June 1999 to allow for a lag in responding to voter preferences yielded no changes in the restrictions variables for the categories of indoor smoking restrictions analyzed here.
18. We use the smoking rate including smoking information reported by proxies in the state-level analysis.

TABLE 6
Smoking Restriction Probit Regressions

	Restaurants	Bars	Malls	Enclosed Arenas	Hospitals
Predicted voter pressure index	25.47**	43.84**	17.74*	11.30**	13.33
	(10.10)	(20.11)	(9.75)	(4.66)	(10.87)
Smoking rate	5.84	11.31	−9.40	−2.02	17.18
	(10.21)	(18.43)	(11.24)	(7.66)	(14.50)
Median income	0.13	−0.06	−0.33	−0.01	1.83
(×$10,000)	(0.44)	(0.64)	(0.67)	(0.39)	(1.14)
Percent GSP from tobacco	0.04	−24.07	−27.51	0.09	−0.93*
	(0.31)	(27.59)	(35.10)	(0.25)	(0.55)
Republican governor/state legislature	−0.80*	—	−1.67*	−0.07	−0.36
	(0.49)		(0.92)	(0.46)	(0.92)
Pseudo *R*-squared	0.26	0.32	0.34	0.14	0.46
Log likelihood	−25.33	−9.47	−14.58	−30.33	−11.90

Notes: Table reports probit coefficients with standard errors in parentheses. The dependent variable equals 1 if the state has any smoking restriction in that public area, and 0 otherwise. Each equation also includes a constant term (not reported). ** (*) indicates coefficient is significantly different from zero at 5% (10%) level, two-sided tests.

regulation is consistent with higher valuation of health with higher income. The vector Z consists of two variables reflecting the influence of interest groups and political ideology. These variables are the percent of a state's gross state product (GSP) from tobacco agriculture and tobacco manufacturing, and an indicator of whether the majority of both houses of the state legislature and the governor of the state belong to the Republican party.[19]

The key independent variable in the state analysis is a measure of r_j^* representing the political pressure for restricting smoking in particular areas. As noted earlier, we use two measures of political pressure, the predicted voter pressure index based on individual preferences weighted by the probability of voting, and the second based on the preferences of actual voters. The means for each of these political pressure indices for the 5 public areas are reported in Table 5.[20] Because the voting rate calculated at the individual level is 50 percent, the mean of the predicted voter pressure index is about half of the mean of the actual voter pressure index.

Tables 6 and 7 report probit estimates for restrictions on smoking in restaurants, bars, malls, enclosed arenas, and hospitals. The smoking restriction variable, R_j, is equal to 1 if the state has a smoking restriction of any kind in the indicated area, and equal to 0 if not. Table 6 reports the estimates using the predicted voter pressure index, and Table 7 is based on the actual voter pressure index. Based on the predicted voter pressure index, we find that voter preferences are positively related to the probability of restriction, with effects that are statistically significant at the 95% level for restaurants, bars, and enclosed arenas and at the 90% level for malls. Using the actual voter pressure index, the probability of restriction in bars, malls, and enclosed arenas is positively related to the voter index at the 90% level or higher. These findings indicate that state policies restricting smoking in bars, malls, and enclosed arenas are consistent with voter preferences.

Although voter preferences are consistently associated with the probability that a state has a smoking restriction, the nonvoter factors are less influential. Smoking rates do not affect regulatory policies, which may reflect the conflicting influences captured by this variable. Median household income is positively related to smoking restrictions in hospitals (at the 95% level in Table 7, and marginally significant with

19. Belief in the ability of markets to address smoking restrictions without government intervention is likely to be correlated with Republican party affiliation. Boyes and Marlow (1996) found less support for restaurant smoking bans among those who felt that market-based allocation of voluntary smoking/nonsmoking sections effectively dealt with the smoking issue.

20. Although the CPS survey reports preferences for indoor work areas, this appeared to be only loosely linked to corresponding restrictions. Because we found no statistically significant link between chosen restrictions on government or private work sites and preferences for restrictions in indoor work areas, these results are not presented in the article. We use preferences for restrictions at indoor sporting events in the equations for state restrictions on smoking in enclosed arenas.

TABLE 7
Smoking Restriction Probit Regressions

	Restaurant	Bars	Malls	Enclosed Arenas	Hospital
Actual voter pressure index	6.11	10.36*	9.04**	6.93**	4.17
	(4.72)	(5.69)	(4.39)	(3.31)	(8.03)
Smoking rate	0.37	− 1.96	− 7.84	− 0.82	15.70
	(10.51)	(12.55)	(11.09)	(7.79)	(14.60)
Median income	0.59	0.10	0.13	0.32	2.21**
(×$10,000)	(0.37)	(0.58)	(0.54)	(0.36)	(1.00)
Percent GSP from tobacco	− 0.23	− 19.66	− 24.19	0.06	− 1.03**
	(0.30)	(30.60)	(31.10)	(0.26)	(0.50)
Republican governor/state legislature	− 0.47	—	− 1.36	0.16	0.33
	(0.45)		(0.87)	(0.44)	(0.67)
Pseudo *R*-squared	0.17	0.22	0.35	0.11	0.43
Log likelihood	− 28.21	− 10.99	− 14.40	− 31.09	− 12.60

Notes: Table reports probit coefficients with standard errors in parentheses. The dependent variable equals 1 if the state has any smoking restriction in that public area, and 0 otherwise. Each equation also includes a constant term (not reported). ** (*) indicates coefficient is significantly different from zero at 5% (10%) level, two-sided tests.

p-value = 0.11 in Table 6), but the state's median income is not associated with the probability that the state has other smoking restrictions. The percentage of GSP attributable to tobacco is only significantly related to the probability of having a restriction in hospitals, with states with a larger tobacco economy less likely to restrict smoking in hospitals.[21] For the estimates using the predicted voter pressure index in Table 6, the indicator for Republican governor/state legislature is negative and significantly related to whether a state has a restaurant or mall restriction at the 90% level. This variable is not included in the probit regression for bars because all states that have a Republican governor and state legislature have no bar restriction, and therefore the variable fully explains the "failure" category of restriction.[22]

In alternative specifications (not reported in the tables) we also explored possible relationships of neighboring states' policies on a state's chosen restriction using regional indicator variables. Although some regional indicator variables were occasionally statistically significant, there was no consistent pattern, and the group of variables as a whole did not add to the explanatory power of the regressions. Smoking policies do not appear to spread around regions.

As Table 3 shows, most states do not restrict smoking at all or require designated smoking areas only. Consequently there are too few observations with more restrictive policies to analyze the influence of voter preferences on stringency of restrictions. The exception is hospital restrictions, in which states show considerable variability in stringency of smoking across states. We estimate ordered probit regressions, with the results reported in Table 8. The dependent variable takes on four possible discrete values: 0 if no restriction; 1 if separate smoking areas are allowed; 2 if separate ventilation or no smoking is required; and 3 if smoking is banned in hospitals. There is some evidence that voter preferences for smoking bans have an impact on the degree of chosen restrictions. The predicted voter pressure index is positively and significantly related to the degree of restrictions, but the

21. In a univariate regression estimated using observations from 1300 owners of restaurants, bar, and taverns, Dunham and Marlow (2000a) find a negative relation between tobacco manufacturing in the state and whether a state has a smoking law affecting restaurants. It is difficult to compare our multiple regression results, which use states as the unit of analysis, to their results based on individual observations.

22. Inclusion of the Republican governor/state legislature variable results in 13 observations being dropped from the probit analyses for bars. The results estimated using a linear probability model (which allows the inclusion of this variable without dropping observations) leads to results consistent with those reported in Tables 6 and 7. We also note that multicollinearity does not seem to be a problem in this sample because the simple correlations are relatively low. The correlations among smoking rate, median income, and percent tobacco are as follows: smoking rate and median income, − 0.34; smoking rate and percent tobacco, 0.28, and median income and percent tobacco, − 0.04.

TABLE 8
Ordered Probit Regressions of Degree of Smoking Restrictions in Hospitals

	Coefficients (SE)	
	(1)	(2)
Predicted voter pressure index	13.01* (7.53)	
Actual voter pressure index		9.08 (6.42)
Smoking rate	11.73 (8.34)	14.47 (9.21)
Median income (×$10,000)	1.74*** (0.61)	1.96*** (0.56)
Percent GSP from tobacco	−0.94** (0.43)	−1.03** (0.41)
Republican govern or/ state legislature	−0.89 (0.60)	−0.49 (0.51)
Pseudo *R*-squared	0.39	0.38
Log likelihood	−28.84	−29.45

Notes: The dependent variable taking on four possible discrete values from 0 (no restriction) to 3 (smoking ban). Each equation also includes a constant term (not reported). *** [**] (*) indicates coefficient is significantly different from zero at 1% [5%] (10%) level, two-sided tests.

actual voter pressure is not significantly related to the degree of restrictions at conventional levels.[23] Higher median household income leads to greater severity of smoking restrictions. The influence of the tobacco industry in the state is also evident as the stringency of smoking restrictions declines with the percent GSP from tobacco. The indicator for Republican governor/state legislator has no effect on the chosen level of hospital restrictions.

V. SIMULATIONS AND PREDICTIONS

The regression equations in Tables 6 and 7 can serve a predictive purpose as well. Consider the values for the state of New York, which engaged in a highly visible debate over smoking restrictions. The coefficient estimates predict the probability that New York will adopt a smoking ban for restaurants is 0.51 using Table 6 coefficients and 0.60 using Table 7 coefficients. The probability of New York adopting a smoking ban in bars is virtually zero using the coefficient estimates from these tables.[24] Nevertheless, in response to Mayor Bloomberg's efforts, New York City imposed a smoking ban for bars and restaurants that took effect in 2003. Also in that year, the state of New York enacted the Clean Indoor Air Act, which prohibited smoking in indoor work sites, including bars and restaurants. Many political observers credit this result to intense lobbying by public health professionals and interest groups like the American Cancer Society. Consistent with our empirical results, much controversy has arisen about the New York smoking ban for bars since its enactment, to the point that a lawsuit to stop the ban has been filed by bar and tavern owners and an industry association.[25]

Notwithstanding the prominence given to the New York smoking ban, nationwide, bans on smoking in bars are much less likely to be adopted than are other forms of smoking restrictions. As of June 2003, only five states had imposed such bans on smoking in bars.[26] The limited support for smoking bans in bars is consistent with the results of this article.

How would policy outcomes throughout the country differ if only the preferences of smokers were permitted to influence policy? To examine this counterfactual, we looked at the number of states for which 50% of smokers favor banning smoking in each area. In no state do the majority of smokers favor banning smoking in restaurants or bars. Presumably, if smokers controlled such policies, there would be fewer restrictions on smoking in these places. In about half the states a majority of smokers support a ban of smoking in malls, and in about 60% of states a majority of smokers favor banning smoking in enclosed arenas. For smoking in hospitals, in all but one state the majority of smokers are in favor of a ban. It appears that smoking restrictions would be little different for malls, enclosed arenas, and hospitals if smokers ruled on these issues.

23. The *p*-value for the actual voter pressure index is equal to 0.16.

24. These predicted probabilities are calculated using the following values of the independent variables for New York State: predicted voter pressure index for restaurants, 0.25, and for bars, 0.16; actual voter pressure index for restaurants, 0.52, and for bars, 0.33; smoking rate, 19.8%; real median income, $37,394; percent GSP in tobacco, 0.22%; and Republican state, 0.

25. See Haberman (2003, A21). For information on the lawsuit see Precious (2003, A9).

26. The five states are California, Connecticut, Delaware, Maine, and New York. See Zezima (2003).

VI. CONCLUSION

There have been remarkable changes in the public's support for smoking restrictions. Gallup poll results in 1977 found that only 16% of the population favored a ban on smoking in public places (trains, buses, airplanes, restaurants, offices), and in 1978 only 43% favored banning smoking completely on commercial airplanes. By the 1998–99 period analyzed here, a majority of voters favored smoking bans in all public areas except for bars, for which support remains under 50%.

Analysis of individual data indicated that smokers are less likely to vote, controlling for other economic and demographic characteristics of the individual, and that smokers are less supportive of smoking restrictions. However, smokers themselves demonstrate relatively high percentages in favor of banning smoking in many public places, so higher voting rates among smokers would have a small impact on state smoking policies.

Smoking restrictions are responsive to voter preferences in the state and, perhaps surprisingly, in many instances are consistent with the preferences of smokers themselves. There is an ordinal match-up of voter preferences and smoking restrictions. Hospital bans command the greatest support and smoking restrictions in hospitals are most widespread, whereas smoking restrictions for bars are the least common and the least favored by the public. State regulations continue to vary in part because of differences in voters' views of smoking restrictions.

Despite the relation between preferences and restrictions and the generally high level of support in favor of bans, the prevalence of smoking restrictions appears to be relatively low. One frequent explanation for the lack of universal smoking restrictions is the importance of the tobacco industry in the states' economies, but we find that this factor has a negative effect only for hospital smoking restrictions. The gap between voter support for smoking restrictions and the presence of such policies within a state suggests that state restrictions are likely to become more widespread in the future.

REFERENCES

Ahmed, Sultan, and Kenneth V. Greene. "Is the Median Voter a Clear-Cut Winner? Comparing the Median Voter Theory and Competing Theories in Explaining Local Government Spending." *Public Choice*, 105(3–4), 2000, 207–30.

Becker, Gary S. "A Theory of Competition among Pressure Groups for Political Influence." *Quarterly Journal of Economics*, 98(3), 1983, 371–400.

Besley, Timothy J., and Harvey S. Rosen. "Vertical Externalities in Tax Setting: Evidence from Gasoline and Cigarettes." *Journal of Public Economics*, 70(3), 1998, 383–98.

Boyes, William J., and Michael L. Marlow. "The Public Demand for Smoking Bans." *Public Choice*, 88(1–2), 1996, 57–67.

Case, Anne C., Harvey S. Rosen, and James R. Hines Jr. "Budget Spillovers and Fiscal Policy Interdependence: Evidence from the States." *Journal of Public Economics*, 52(3), 1993, 285–307.

Congleton, Roger D., and Randall W. Bennett. "On the Political Economy of State Highway Expenditures: Some Evidence of the Relative Performance of Alternative Public Choice Models." *Public Choice*, 84(1–2), 1995, 1–24.

Dunham, John, and Michael L. Marlow. "The Effects of Smoking Laws on Seating Allocations of Restaurants, Bars, and Taverns." *Economic Inquiry*, 38(1), 2000a, 151–57.

———. "Smoking Laws and Their Differential Effects on Restaurants, Bars, and Taverns." *Contemporary Economic Policy*, 18(3), 2000b, 326–33.

Enstrom, James E., and Geoffrey C. Kabat. "Environmental Tobacco Smoke and Tobacco Related Mortality in a Prospective Study of Californians, 1960–98." *British Medical Journal*, 326, 2003, 1057–61.

Evans, Williams N., Matthew C. Farrelly, and Edward Montgomery. "Do Workplace Smoking Bans Reduce Smoking?" *American Economic Review*, 89(4), 1999, 729–47.

Haberman, Clyde. "If Virtue Has Prevailed in Smoking Ban, Why Are So Many People Upset?" *New York Times*, 25 July 2003, p. A21.

Hunter, William J., and Michael A. Nelson. "The Political Economy of State Tobacco Taxation." *Public Finance/Finances Publiques*, 47(2), 1992, 214–28.

Inman, Robert P. "Markets, Government, and the 'New' Political Economy," in *Handbook of Public Economics, Volume 2*, edited by Alan J. Auerbach and Martin Feldstein. New York: Elsevier, 1987, 647–777.

Jacobson, Peter D., Jeffrey Wasserman, and Kristiana Raube. "The Politics of Antismoking Legislation." *Journal of Health Politics, Policy & Law*, 18(4), 1993, 787–819.

Karr, Albert, and Rose Gutfeld. "Workplace: OSHA Inches Toward Limiting Smoking." *Wall Street Journal*, 16 January 1992, B1.

Madrian, Brigitte C., and Lars John Lefgren. "An Approach to Longitudinally Matching Current Population Survey (CPS) Respondents." *Journal of Economic and Social Measurement*, 26(1), 2000, 31–62.

Nelson, Michael A. "Using Excise Taxes to Finance State Government: Do Neighboring State Taxation Policy and Cross-Border Markets Matter?" *Journal of Regional Science*, 42(4), 2002, 731–52.

Peltzman, Sam. "Toward a More General Theory of Regulation." *Journal of Law and Economics*, 19(2), 1976, 211–48.

Precious, Tom. "Bar Industry Sues State to Block Smoking Ban." *Buffalo News*, 23 July 2003, p. A9.

Stanton, Timothy J., and John C. Whitehead. "Special Interests and Comparative State Policy: An Analysis

of Environmental Quality Expenditures." *Eastern Economic Journal*, 20(4), 1994, 441–52.

Stigler, George J. "The Theory of Economic Regulation." *Bell Journal of Economics and Management Science*, 2(1), 1971, 3–21.

U.S. Department of Health and Human Services. *Reducing Tobacco Use: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention, Office of Smoking and Health, Atlanta, GA, 2000.

U.S. Environmental Protection Agency. *Respiratory Health Effects of Passive Smoking: Lung Cancer and Other Disorders*. EPA/600/6-90/006F, Office of Health and Environmental Assessment. Washington, DC: U.S. Environmental Agency, 1992.

Viscusi, W. Kip. *Smoke-Filled Rooms: A Postmortem on the Tobacco Deal*. Chicago: University of Chicago Press, 2002.

Zezima, Katie. "National Briefing New England: Maine: Expansion of Smoking Ban." *New York Times*, 25 June 2003, p. A18.