

The public demand for smoking bans*

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Abstract. Smoking bans are gaining widespread support in the United States and other countries. While supporters argue that bans are necessary to resolve market failures associated with negative externalities, the Coase Theorem predicts that, under various conditions, private markets internalize negative externalities. We examine the smoking issue within the framework of the Coase Theorem and hypothesize that smoking bans misallocate air space resources shared by smokers and nonsmokers. Because smoking bans shift ownership of scarce resources, they are also hypothesized to transfer income from one party (smokers) to another party (nonsmokers). Supporting evidence for these hypotheses is provided by an examination of a comprehensive smoking ban imposed in San Luis Obispo, CA.

1. Introduction

Smokers are subject to an increasing number of laws and regulations restricting their behavior. The public sector has imposed cigarette excise taxes and restrictions on cigarette advertising for many years. Another restriction on smokers has recently gained widespread support in the United States where all but four state legislatures have passed bans of varying degrees on smoking in public places and many cities have imposed their own more comprehensive bans on smoking. Most recently, the federal government has proposed a nationwide ban on smoking in all non-residential buildings and similar bans have also been proposed in France and Italy.

Supporters of smoking bans argue that these restrictions are necessary because, in addition to past research which documents that smoking adversely affects the health of smokers, recent reports document a link between passive smoke and the health of nonsmokers. Evidence on the health risks associated with passive smoke is therefore used to bolster claims that smoking exerts a negative externality on nonsmokers.¹

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In this paper smoking bans are examined within the framework of the Coase Theorem where the basic message is that, when transaction costs are zero and property rights are well-defined, private markets internalize negative externalities. We hypothesize that, because private markets internalize the smoking externality, smoking bans misallocate air space resources shared by smokers and nonsmokers and transfer income from one party (smokers) to another (nonsmokers). Supporting evidence for these hypotheses is provided by a data set we have compiled on the influence of a comprehensive smoking ban placed on all restaurants and bars in San Luis Obispo, CA.

2. The Coase Theorem and smoking in restaurants and bars²

The Coase Theorem (1960) predicts that private markets internalize negative externalities when there are zero transactions costs – information is perfect and the cost of bargaining and enforcing contracts between parties is zero – and property rights are clearly assigned to all resources. Application of the Coase Theorem to the case of smoking must therefore address whether: (1) the air space shared by smokers and nonsmokers is privately owned and (2) whether transactions costs are prohibitive.

Although it is common to view clean air as a resource in the public domain, this is not true in the case of the air space within privately-owned establishments such as restaurants and bars. Owners of these establishments are owners of the air space and allocate the airspace between two distinct demanders: smokers and nonsmokers. Smokers and nonsmokers compete for use of the air space in much the same way as moviegoers compete with one another for the use of movie theaters. Some moviegoers enjoy drama, others enjoy comedies and still others enjoy some combination of the two. Owners of movie theaters understand that patrons have dissimilar demands and provide a mix of movies which maximizes expected profits. Owners of restaurants and bars are also owners of resources within their establishments and therefore have incentives to allocate their air space between smokers and nonsmokers in order to maximize expected profits.

The other requirement for an efficient allocation of the air space is that transactions costs not be prohibitive. The commonly-made assertion that transactions costs are much too high for application of the Coase Theorem to smoking ignores the role of owners of restaurants and bars as intermediaries in the negotiation between smokers and nonsmokers.³ While it would be unrealistic to assume that smokers and nonsmokers directly negotiate with one another every time they patronize a bar or restaurant, in a certain sense, negotiation between smokers and nonsmokers does occur via the owners of the private establishments. Air space within bars and restaurants is not common property;

rather, it is the property of the owner of the establishment. Owners determine what air space allocation between smokers and nonsmokers is consistent with maximum profits and therefore all externalities are fully internalized within the decision calculus of owners. To the extent that owners guess wrong and thus displease patrons, owners bear lower profits. Unlike cases where air resources are subject to common ownership, and therefore involve many competing owners of the air space, transactions costs are mostly irrelevant for restaurants and bars. Firms with higher percentages of smoking customers tend to exert fewer resources to reducing smoke than firms with lower percentages of smoking customers.⁴

3. The Coase Theorem and smoking bans

Our discussion suggests that, prior to a smoking ban, private owners of the air space within restaurants and bars internalize much of the negative externality associated with smoking.⁵ While the presence of imperfect information may result in an allocation that is less than perfectly efficient, there can be no doubt that the private market addresses the negative externality. Thus, smoking bans cause the air space to be over-allocated to nonsmokers and under-allocated to smokers. In effect, the transactions costs of smokers competing for usage of the air space rises from some finite value to near infinity.⁶ Smoking bans shift ownership of the airspace away from owners of firms to nonsmokers and, in effect, the government claims ownership of the air space and then allocates it at a zero price to nonsmokers. Nonsmokers therefore receive an income transfer because they are not required to compensate smokers nor breathe smoke-filled air.

4. Empirical evidence

4.1. Model

The demand for smoking bans depends on how such bans affect individuals. We derive the demand for a smoking ban from a utility maximization problem where individuals gain utility from frequenting restaurants and bars. Consider the simple model where the individual maximizes

$$U(E,X) + \lambda[Y - c_E E - c_X X] \tag{1}$$

where E is consumption of the services of restaurants and bars, X is the consumption of other goods and services, Y is the budget, and c are costs. Variable

c_E depends on (a) the price of food and beverages, (b) the interaction among smokers and nonsmokers, (c) one's utility or disutility from smoking which, in turn, depends on one's age, sex and education (see Dusenberry et al., 1992; Ryan et al., 1992; Wake et al., 1991), and (d) whether a smoking ban is in place.⁷

Under appropriate conditions,⁸ optimization yields the demand for bans

$$\text{ban} = F^{-1}(\lambda, U_E, \text{age, sex, education, relative costs}). \quad (2)$$

We specify the utility of frequenting restaurants and bars as the actual number of times in a given period an individual goes to the establishment and the marginal utility as the change in that frequency. The relative costs and shadow price, λ , are measured by whether one is a smoker or a nonsmoker, and measurement of the other variables is straightforward. Given these specifications, the demand for a smoking ban is represented as:

$$\text{ban}^D = D(\text{age, sex, education, frequency, smoker/nonsmoker}). \quad (3)$$

4.2. Data and estimation

The data used to estimate the demand for a smoking ban were derived from a survey of 764 randomly chosen individuals in the city of San Luis Obispo, CA (SLO) during 1992; of these, 84% were nonsmokers and 87% were residents of SLO city and county.⁹ SLO imposed a ban on smoking in all enclosed public places late in the summer of 1990. SLO is a city of roughly 40,000 residents surrounded by approximately 10 miles of open space (a terrain characterized by many mountains and valleys). Several cities of population sizes 10,000 to 25,000 lie near or just beyond that 10 mile open space and are located within the county of SLO. Data were collected relating to the effects of the smoking ban on businesses, smokers, nonsmokers, and tourists.

The results of a logit estimation of the demand for smoking bans are reported in Table 2. Variables used in the estimation are described in Table 1. The two dependent variables are: (1) do you strongly support the ban in restaurants? and (2) do you strongly support the ban in bars? The odds of supporting smoking bans are estimated as a function of the frequency with which restaurants and bars are visited, whether one is a smoker, ex-smoker, local resident, or male, and the age and education characteristics of respondents. Numbers of responses, and which response was given to the questions, are shown at the bottom of Table 2. Total number of responses reflects the actual number of respondents who answered all questions required to measure all variables in each equation.

Table 1.

Dependent variables
1. Strong support for restaurant ban. Strong support = 1; no support = 0.
2. Strong support for bar ban. Strong support = 1; no support = 0.

Independent variables
1. Frequency restaurants. Times per month.
2. Frequency bars. Times per month.
3. Smoker = 1 if smoker; = 0 if nonsmoker.
4. Ex-smoker = 1 if ex-smoker; = 0 if not ex-smoker.
5. Local = 1 if local; = 0 if non-local.
6. Male = 1 if male; = 0 if female.
7. Age. Years.
8. Education. Years.
9. Do you believe that smoking/nonsmoking sections effectively deal with smoking issue? = 1 if yes; = 0 if no.

The estimation results are shown in columns (1) and (3). The number of times per month that a respondent frequents restaurants or bars does not significantly influence the odds of supporting smoking bans. As expected, the odds of supporting bans in both restaurants and bars falls considerably for smokers (vs. nonsmokers). While being an ex-smoker does not influence the odds of supporting bans in restaurants, this characteristic does strongly and inversely influence the odds of supporting bans in bars. The odds of supporting smoking bans in restaurants and bars is not influenced by whether the respondent is from the local community (vs. non-local). The odds of supporting smoking bans in restaurants and bars are lower for males than for females. Age and education do not influence the odds of supporting smoking bans in restaurants or bars.

To this point, our examination of the public demand for smoking bans has not considered whether respondents believe that the private market deals effectively with the smoking issue. The marginal utility of frequenting a restaurant or bar may depend on how one reacts to the owner's attempts to deal with the smoking externality. Simple inspection of our survey indicates that 62% of nonsmokers and 40% of smokers believe that smoking/nonsmoking sections are effective means of dealing with the smoking issue. Using the 84% of our sample that are nonsmokers as the population probability of nonsmoking, a random response of nonsmokers to this question would have yielded 84% no and 16% yes. A one-tailed chi-square test indicates that the response that "smoking/nonsmoking sections are effective" was chosen more than a random choice would have indicated and is significant at the .05 level. As further

Table 2. Demand for smoking ban

	Strong support for restaurant ban		Strong support for bar ban	
	(1)	(2)	(3)	(4)
Constant	3.99*	4.71*	2.43*	2.92*
	5.89	6.43	4.55	5.24
Frequency restaurants	-0.20	-0.32		
	0.63	0.96		
Frequency bars			-0.44	-0.39
			1.57	1.33
Smoker	-3.93*	-3.85*	-4.11*	-4.03*
	10.72	10.05	10.81	10.37
Ex-smoker	-0.65	-0.42	-0.78*	-0.66**
	1.59	1.02	2.49	2.06
Local	-0.56	-0.60	0.05	0.02
	1.02	1.10	0.11	0.03
Male	-1.11*	-1.07*	-0.51***	-0.48***
	3.32	3.07	1.83	1.68
Age	0.13	0.04	0.05	-0.07
	0.36	0.11	0.17	0.22
Education	0.46	0.48	0.36	0.39
	1.39	1.41	1.22	1.28
Smoking/nonsmoking effective		-1.44*		-1.05*
		4.23		3.67
Log likelihood	-145.52	-135.32	-184.35	-174.38
Cases with dependent variable = 0	84	83	131	129
Cases with dependent variable = 1	485	478	390	386
Sample	569	561	521	515

t-statistics below estimated coefficients

*, **, *** refer to .01, .05, .10 significance (2-tailed).

evidence that the private market internalized some degree of the smoking externality, our survey indicated that, prior to the ban, 95% of nonsmokers and 31% of smokers requested nonsmoking sections of restaurants.¹⁰

Table 2, columns (2) and (4), shows the results of estimations with the additional independent variable, "smoking/nonsmoking effective," which measures whether respondents believed that smoking/nonsmoking sections in restaurants worked well in allocating airspace prior to the smoking ban. While this information may provide an important control variable in our regressions, we must be careful to not over-emphasize its connection with the associated belief that private owners of the air space fully internalize all externalities. It would appear that respondents who believe that smoking/nonsmoking sections

deal effectively with the smoking issue will also believe that the private owners of the air space have appropriately internalized the externality. But it is more problematic to draw the opposite conclusion when respondents state that such sections do not deal effectively with smoking. For several reasons, respondents could believe that the externality has been internalized, but also believe that smoking should be banned. One reason could simply be that they believe that all smoking should be prohibited. Another reason could be that they favor a transfer of ownership rights from restaurant and bar owners to nonsmokers who simply want all smoking banned. In either case, respondents could believe that private owners fully internalize the externality, but for other reasons, state that they believe that smoking/nonsmoking sections are ineffective.

The estimations listed in columns (2) and (4) show no change in the significance of independent variables from those listed in columns (1) and (3); i.e., characteristics related to smoking, ex-smoking and sex continue to be inversely related to the odds of supporting smoking bans. However, the odds of supporting bans in either restaurants or bars falls considerably when respondents believe that smoking/nonsmoking sections worked well prior to the ban. This result suggests that, after controlling for all other independent variables and understanding the possible ambiguity with associating a negative response with the belief that private owners of the air space do not fully internalize externalities, respondents who believe that the private market internalizes an adequate degree of the smoking externality are less likely to support smoking bans than those who state that smoking/nonsmoking sections are ineffective.

4.3. Survey of businesses

In addition to examining smoking bans from the perspective of smokers and nonsmokers, we looked at the bans from the perspective of businesses. Sixty-four restaurants and bars were surveyed – a sample that constitutes roughly 65% of the total number in the city of SLO. Although all firms in SLO were provided a survey, our sample represents all who responded. Sixty-five percent of respondents are restaurants, 9% are bars and 26% are both.

Table 3 reports responses by businesses to six questions concerning the smoking issue.¹¹ Responses to question 1 reveal the percentages of patrons that smoked in these establishments. Clearly, most businesses catered to both smokers and nonsmokers prior to the smoking ban, since 42% of the businesses had between 11–20% of patrons who smoked. Responses to question 2 indicate that 61% of all businesses had expended resources toward reducing smoke from their air space and responses to question 3 indicate that provision of smoking/nonsmoking sections was the principal means of reducing smoke. Responses to question 4 indicate that, prior to the ban, a majority of businesses

Table 3. Survey results (asked of businesses)

1. What percentage of patrons smoked (before ban)?			
<i>1-10%</i>	<i>11-20%</i>	<i>22-30%</i>	<i>31-40%</i>
20%	42%	25%	2%
2. Prior to passage of the ban, did you attempt to reduce smoke in your business?			
<i>Yes</i>	<i>No</i>		
61%	39%		
3. If attempts were made to reduce smoke, what form did they take?			
Smoking/nonsmoking sections	62%		
Improved ventilation	3%		
Patio	19%		
Other	14%		
4. Did you receive many complaints about smokers? (pre-ban)			
<i>Yes</i>	<i>No</i>		
32%	68%		
5. Prior to passage of ban, were you in favor of ban?			
<i>Yes</i>	<i>No</i>		
53%	47%		
6. What impact has ban had on your business?			
<i>Positive</i>	<i>Negative</i>	<i>No impact</i>	
17%	25%	57%	

(68%) did not receive “many” complaints from nonsmokers about smoking. These responses suggest that businesses internalized some degree of the smoking externality prior to the ban. This may also explain why, as seen from responses to question 5, only a slim majority (53%) of businesses supported the smoking ban.

It is unlikely that businesses would react to the competing demands of smokers and nonsmokers in identical ways prior to the ban. It is more likely that a market segmentation would evolve whereby some firms cater more to smokers than others. A smoking ban would therefore not uniformly affect businesses. Businesses that catered to smokers would tend to be more negatively impacted by the ban. Businesses that sought a mix between smokers and nonsmokers would have invested in smoking-nonsmoking separations or air ventilation systems and may now find these costs to be sunk and their investments made worthless by the ban. Businesses that catered to tourists may also be more adversely affected than businesses that catered primarily to local residents when tourists are less supportive (than locals) of the comprehensive smoking ban in SLO.

To the extent that businesses lose customers as a result of the ban, businesses lose sales. Establishments, however, may gain sales when those customers, who were unhappy over the extent to which the externality had been internalized, increase their patronage. Responses to Question 6 indicate that 25% of the

businesses report a negative impact while 17% report a positive impact and 57% report no effect. The survey data indicate that all businesses reporting a negative influence were previously opposed to the smoking ban. On average, these businesses had a relatively high share of tourists (median = 21–40%) and, prior to the ban, a relatively low percentage of customers who were non-smokers (median = 11–20%). In contrast, of those firms reporting a positive influence on their profits, all but one had previously been in support of the ban. On average, these businesses had a relatively small share of customers who are tourists (median = 11–20%) and, prior to the ban, a relatively high percentage of customers who are nonsmokers (median = 21–40%).

5. Conclusions

In this paper we have reported on a study of how the private market deals with negative externalities associated with smoking in restaurants and bars. We hypothesized that, because the air space in private establishments is privately owned and transaction costs are not prohibitive, the private market internalizes the smoking externality. This is consistent with the Coase Theorem and implies that smoking bans cause the air space to be overallocated to nonsmokers. We provided evidence of this result drawn from the imposition of a smoking ban in San Luis Obispo, CA. We found that even though private restaurants and bars expended resources to lower the extent of negative externalities present in their air space in San Luis Obispo, CA, and that a majority of nonsmoking patrons were also satisfied with the degree of internalization as evidenced by their approval of smoking/nonsmoking sections, the ban was imposed.

We draw two primary conclusions from this study. The first is that, while critics of the Coase Theorem often argue that transactions costs are too high to support the possibility that private markets allocate resources efficiently, a distinction must be drawn between a commonly owned resource and a privately owned resource. In the case of a privately owned resource, such as the airspace within a privately owned business establishment, the public policy used to “remedy” the supposed market failure causes the transactions costs of one participant in the market (smokers) to rise from some finite value to near infinity. Thus, smoking bans create a situation where users of the privately owned air space may no longer bid for use of that resource and the private property owners can no longer efficiently allocate it between smokers and nonsmokers.

The second conclusion is that smoking bans transfer income from smokers to nonsmokers since nonsmokers no longer must bid for their use of the air space and smokers no longer have the right to smoke. Whether or not this transfer results in an improvement in social welfare is clearly beyond the scope of this study.¹² However, the result that whether respondents smoke is a sig-

nificant influence on whether they support smoking bans suggests that some portion of the support for smoking bans is based on the desire of supporters to transfer income to themselves. Under this view, passage of the smoking ban in San Luis Obispo represents a transfer of income from a minority (smokers) to a majority (nonsmokers). Survey evidence indicates that a majority of nonsmokers (62%) believe that smoking/nonsmoking sections effectively deal with the smoking issue and our estimation of the public demand for smoking bans indicated that, after controlling for various characteristics, respondents who believed that smoking/nonsmoking sections were effective tended to be against smoking bans in restaurants and bars. This result could suggest that those who support smoking bans also tend to believe that the private market does not internalize enough of the externality and, in this way, believe that bans promote a more efficient allocation of the air space. But, advocates of bans may simply support a transfer of ownership rights from owners of bars and restaurants to nonsmokers. Further research on separating those who support bans because they believe they promote a more efficient allocation of resources from those who simply wish to transfer income to nonsmokers would provide further insight into the determinants of the demand for smoking bans.

Notes

1. Proponents of smoking bans often argue that taxpayers pick up part of the higher health care costs of smokers in Medicaid, Medicare and private insurance programs. However, Lee (1991a, 1991b) suggests that smoking bans can not be expected to lower this type of externality.
2. Lee (1991a: 86) notes that owners of private establishments have an incentive to internalize the externality. Tollison and Wagner (1992) also examine the Coase Theorem within the context of smoking externalities.
3. Phelps (1992: 430), for example, argues: "Trying to use agreements . . . between people in a restaurant to determine whether smoking would take place would be the height of absurdity, and nobody would think seriously of a full "property rights" approach to such a problem. The transactions costs of reaching agreements would overwhelm the problem."
4. An illustration is provided by the hotels and casinos in Las Vegas. Excalibur was the first to open a nonsmoking gaming area and advertise the distinction between smoking and nonsmoking gaming areas. Other hotels and casinos have followed suit.
5. "Much of" or "all" of the externality is internalized, depending on how imperfect information is.
6. Or infinity, depending on the degree to which the smoking ban is enforced.
7. Variable c_B may also include the cost of lobbying for or against a ban relative to the cost of lobbying the owner of the establishment to cater to smokers or nonsmokers.
8. Using the implicit function theorem on the first order conditions.
9. Eight students at Cal Poly, San Luis Obispo, passed out and collected data surveys in various downtown locations in SLO during April and May 1992.
10. Interestingly, 31% of smokers requested nonsmoking sections as well. We do not know whether this was because they were with nonsmokers or because they preferred the ambience of nonsmoking sections, or some other reason. Also, we were unable to determine whether

smoking/nonsmoking separations in restaurants were due to legislation or to voluntary choice on the part of restaurant owners. The business owners, as discussed below, indicated many different ways they attempted to cater to smokers and to nonsmokers and implied they were far out in front of any legislation in ensuring that their customers were satisfied.

11. We estimated the effect of the ban on businesses in a logit framework, but the number of observations was insufficient due to cases of missing responses.
12. The criteria of Pareto optimality shows that, unless smokers are compensated for their loss, the new allocation of resources does not improve everyone's welfare. Others, however, may argue that if the new allocation meets the compensation criteria of Kaldor (1939), then social welfare is improved.

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