RESTAURANT OWNERS' PERCEPTIONS OF EFFECTS OF A SMOKING BAN*

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ABSTRACT

The aim of this paper is to analyze business owners' expected changes in turnover due to a general smoking ban in restaurants, bars and cafés in Sweden. This is accomplished using a survey mailed out to all 642 restaurants, bars, cafés and nightclubs in Gothenburg. The results show that the dependence on smoking customers and the beliefs on how the whole restaurant sector would be affected are in terms of size and statistical significance, the most important variables for explaining expectations of changes in turnover. The econometric results show that the owners are more likely to expect a decrease in turnover the larger the share of smoking customers is. Moreover, owners are less likely to expect financial losses due to a general smoking ban if establishments do not currently allow smoking or have a non-smoking section. No strong effect of the type of establishment on expected changes in turnover is detected, even though establishments with late night hours are more likely to expect financial losses. The study also, tentatively, concludes that many owners do not take general equilibrium effects into account, which may bias their expectations of turnover downwards. *Resistance* to a general smoking ban is not only explained by an expected loss in turnover, but also by the owners' attitudes towards customers smoking, property right over air space, and perception of the restaurant sector turnover. Resistance to a smoking ban is also greater among bars/nightclubs and restaurants compared to cafés.

Key words: Smoking ban, cigarette consumption, policy

JEL classification: H0, I18, K2

1 INTRODUCTION

In this paper business owners' expected effects of a general smoking ban on turnover are analyzed using a survey mailed to restaurants, bars, and cafés in Gothenburg, Sweden. Currently in Sweden, there are both establishments that allow smoking and those that do not. During the fall of 2000, the Committee on Public Health proposed an extension of the Swedish tobacco law to include restaurants, cafés and bars in its smoking ban in public places (SOU 2000:91), but the implementation has not yet been realized. In this micro study at the firm level, the focus is on owners' expectations regarding turnover. The few previous studies conducted on the economic effects of smoking bans show no clear evidence on how the restaurant sector is affected by tighter smoking regulation. Glantz and Smith (1997) compare the sales tax data of communities with smoke-free bar and restaurant ordinances with the data of communities that have at least 60 percent of seating reserved for non-smokers. Hence, they study the effects on total *actual* retail sales of eating and drinking establishments in California after implementing smoking bans, and find no significant effect on the fraction of total retail sales.[2] Dunham and Marlow (2000a), using a nationwide US survey on restaurants, bars and taverns, find results consistent with the hypothesis that customer preferences influence owners' allocation of smoking and non-smoking seats. Dunham and Marlow (2000b), after asking owners about their projections of revenues following new smoking laws, report that revenues would be *expected* to decrease by 39 percent for restaurants and 83 percent for bars and taverns if smoking bans were to be implemented. This also directs attention to the fact that the distribution of effects of a smoking ban is not uniform among the types of establishments. Previous studies have, just like this one, for practical reasons focused on turnover, although profits are the main concern.

From a profit maximizing perspective, we expect that a firm's attitude towards a smoking ban depends primarily on the expected change in profits resulting from the ban. A new and stricter regulation changes the market equilibrium, and it is possible to hypothesize several effects from an implementation of a general smoking ban. First, since customers who like to smoke during their visits no longer can, a ban would make

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[2] Glantz and Smith (1997) also control for serial correlation by including a quadratic term in time reflecting the business cycle during the period studied.

visits less attractive, which would be expected to negatively affect turnover in the restaurant sector. Hence, establishments currently without smoking bans are expected to lose customers if a smoking ban were implemented. Second, we also expect that the larger the share of smoking customers an establishment has, the more it will lose from tighter smoking regulations.

Third, assuming that there would not be an increase in the number of non-smoking customers after a general smoking ban, the net of two effects determines the economic performance of the establishments. On the one hand, the establishments with current smoking bans may lose non-smoking customers since their non-smoking niche would disappear, but on the other hand they may gain smoking customers since a general smoking ban would neutralize the current preference for the smoker-friendly establishments. The expected net outcome is difficult to predict for restaurant owners as well due to general equilibrium effects. When owners try to pass their expectations from the level of the individual restaurant on to the level of the whole sector, their judgement may be quite misleading. If an individual restaurant prohibits smoking, smokers may either stay at home or go to another restaurant. If the whole restaurant sector prohibits smoking only the first alternative remains and thus the effect of a general ban on an individual establishment would be smaller.

Fourth, could there be an increase in the number of non-smoking customers as a result of a smoking ban? Even though non-smokers constitute a large majority of restaurant customers, the existence of smoke-free alternatives and of non-smoking sections within establishments indicate that the effect of a general smoking ban on non-smoker behavior is minor. However, one can speculate about the importance of social interaction and special characteristics of the establishment. For instance, non-smokers who socialize with smokers during restaurant visits might be more inclined to frequent smoke-free environments, which would be possible if a general smoking ban were implemented. This would hence increase the number of visits. Furthermore, depending on how important a smoke-free environment is for non-smokers, some places with special characteristics not found among the smoke-free places might be more attractive for non-smokers if a general smoking ban is implemented. Finally, one could hypothesize about the amount of money spent at restaurants by smokers compared to non-smokers.

In this paper, the aim is to evaluate the impact of a general smoking ban on restaurants, bars and cafés in Gothenburg. One obvious problem with such an analysis is the lack of market data, and we therefore rely on the results from a stated preference survey, in which we have asked owners in the restaurant sector about their expectations of potential changes in their turnover resulting from a general smoking ban. This paper gives a number of contributions. First, very few studies (this is the first one using European data) have been conducted on the effects of a smoking ban in restaurants. Second, compared to previous studies, we analyze in more detail the determinants of the effects of a smoking ban on economic performance by including attitudes related to the smoking ban, and by controlling for several background characteristics such as type of establishment, existence of non-smoking section, dependence of smoking customers, etc. Third, the use of a stated preference approach allows for an analysis of effects not possibly disentangled in a revealed preference framework. For instance, the results show that attitudes are important in explaining expected effects, and that attitudes only to a minor degree bias owners' expected effects on turnover. Fourth, this study also points to the difficulty of predicting general equilibrium effects, and to the fact that this difficulty might influence owners' expectations of the expected effects of smoking regulations. Finally, this study analyzes the resistance to a general smoking ban, and thereby also contributes to the understanding restaurant sector regulations. Consequently, the results are of policy relevance with respect to acceptance and implementation of smoking regulations.

The next section provides some background on the rationale for smoking regulations. The data is then presented, followed by the modeling approach. The econometric results of expected effects on turnover, and an adhering discussion that broadens the analysis of economic effects to include voter support among owners, precede the concluding remarks.

2 Rationale for Smoking Regulation in the Restaurant Sector

Regulation of smoking behavior is mainly motivated by the health hazards caused by smoking. In Sweden 8,000 individuals per year die due from their own smoking, and

500 die from exposure to environmental tobacco smoke (SOU 2000:91),[3] making tobacco the largest health risk in Sweden. In comparison, 600 individuals die in traffic each year in Sweden. The Swedish tobacco law implemented in 1993 (SCS 1993:581) banned smoking in public places. The restaurant sector was exempt from this, but establishments with more than 50 seats have since had to provide non-smoking tables. Also, it was stated that no one, against her will, should be exposed to tobacco smoke at work, but it was left to the employee to claim this right. However, people employed in the restaurant sector are excluded in this formulation in SCS 1993:581. From a public health policy perspective the rationale of smoking bans in restaurants is that it decreases exposure to environmental tobacco smoke for customers as well as for employees. It is known that environmental tobacco smoke damages health (CEPA 1997, Barnes et al. 1998), and evidence on the links between environmental tobacco smoke and adverse health effects has been known for about 20 years (e.g. US DHEW 1979). Naturally, people such as those working in the restaurant sector are of extra concern due to their high degree of exposure to environmental tobacco smoke.

Smoking regulations in restaurants might decrease the number of smokers and the cigarette consumption of smokers. Chaloupka and Wechsler (1997) find that restaurant smoking restrictions decrease smoking participation in society, but do not decrease cigarette consumption among young adults. Chaloupka and Grossman (1996) find that cigarette consumption is negatively affected by restaurant smoking restrictions among youths, while the results on participation are ambiguous. Hammar and Carlsson (2001), using a stated-preference survey, find that regulations in restaurants, bars and cafés seem to increase the rate of quitting smoking in a group of regular adult smokers.[4]

Moreover, consumption of tobacco is to some extent cue dependent, where a restaurant visit works as a cue that triggers smoking. From a policy perspective, allowing smoking in restaurants can be seen as a reinforcement of addiction.[5] A smoking ban would take away this cue and possibly make a visit less attractive for some

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[3] Also known as "passive smoking", "second hand smoke", and "involuntary smoking"

[4] Decker and Schwartz (2000), using individual data, find that higher beer prices decrease both alcohol and smoking participation, while higher cigarette prices tend to increase drinking and decrease smoking participation. Among those who continue smoking, substitutability is indicated for alcohol and cigarettes. Several other studies (e.g. Wasserman et al. 1991; Chaloupka and Saffer 1992; Ohsfeldt et al. 1999; Evans et al. 1999) show that stricter restrictions induce lower smoking prevalence.

[5] See Elster (1999) for an overview of emotion and addiction, and Cameron (2000) for a model of nicotine addiction accounting for economic, biological and psychological effects.

smokers. There is also some evidence that one reason regulations are not tougher is that the tobacco industry spends a lot of money on lobbying for leniency, and on different measures affecting the public perception of health risks related to environmental tobacco smoke (Ong and Glantz 2000).

3 DATA AND DESCRIPTIVE RESULTS

A questionnaire was sent out to the owners[6] of each of the 642 restaurants, bars, cafés and nightclubs in downtown Gothenburg, Sweden during the fall of 2000. Of these, 37 were returned as undeliverable because the business had ceased, or the addresse was "unknown". The overall response rate was 27 percent after the first round and 42 percent after one reminder, resulting in 252 returned questionnaires.[7] The questionnaire consisted of two parts: (i) questions directly related to smoking bans and (ii) questions about the characteristics of the establishment. Unfortunately, but intentionally, questions concerning the smoking habits of owners, managers and employees were not included in the questionnaire, since it was expected tha questions of this sort would decrease the response rate.

Restaurant owners can respond more easily to expectations concerning turnover compared to expectations of profit.[8] Naturally, our focus on revenues has a limitation since it does not consider the costs of allowing smoking (or banning smoking). One further advantage of choosing revenues as the measure of economic performance is that it allows for comparisons with previous studies. The central question in the survey was hence about the owners expected changes in turnover due to a general smoking ban: *"Imagine that all restaurants, bars and cafés have to implement a smoking ban due to a new law. How do you think your turnover will be affected?"*

Owners thus state their expected effects of a regulation on turnover. Our sample is probably not representative of all restaurants, bars, cafés and nightclubs in

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[6] The wording in the questionnaire was "This questionnaire is meant to be filled in by the owner or other responsible person at your establishment, who has a good understanding of your business." From now on the term "owner" refers to this wording.

[7] These addresses were distributed by Björn Närlundh, miljöförvaltningen, Göteborgs Stad. One reason for the 37 "drop outs" is that the address list was one year old.

[8] Various personal communication with, among others, Allan Nyrén Swedish Hotels and Restaurants Association (SHR) and face-to-face interviews with restaurant managers.

Sweden since it only includes establishments in the city center. It does, however, include places often claimed to "suffer the most" (bars and nightclubs with late night open hours) from a general smoking ban. The question, *"How is your business best characterized?"* included four alternatives and allowed the respondents to mark more than one category. We create three categories for the types of establishments (later used in the estimations): (1) *cafés*; (2) *bars*, for establishments marked bar, nightclub or bar/restaurant; and (3) *restaurant*, for businesses marked café/restaurant or restaurant. A majority, 129 out of 244, of the responses came from *restaurants*. [9]

Table 1 presents the expected turnover by type of establishment, and it can be seen that 128 responses out of 244 (52 percent) believe that a smoking ban would decrease turnover either somewhat or much, or even make the establishment go bankrupt. If we assume that those answering "somewhat lower" are not severely hurt, then 181 out of 244 (74.1 percent) can cope with a general smoking ban. A general smoking ban is not expected to increase turnover for individual restaurants, with the exception of 12 responses (4.9 percent). As expected, nightclubs and bars believe that they will suffer the most from a smoking ban — 37 out of 53 (69.8 percent) expect a decrease in turnover or even bankruptcy. [10]

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[9] When looking at the names of the non-responding establishments it is fair to say that pizzerias and small cafés are slightly underrepresented in the analyzed sample. It is also likely that owners with limited Swedish language skills answered to a less extent due to the questionnaire being in Swedish.

[10] These statistics can be compared to a survey sent to 600 restaurants (excluding establishments with fewer than five employees) collected by Demoskop and reported by SHR, where 55 percent expect that a smoking ban would have no negative effect on turnover while 43 percent think it would affect turnover negatively (Restauratören 2000).

Table 1. Expected change in turnover by type of establishment if they all must implement a smoking ban due to a new regulation (number of responses)

Type	*BAR* Bar, bar/nightclub, bar/restaurant	*CAFÉ*	*RESTAURANT* Restaurant, café/ restaurant	Total	Total (%)
much higher	1	1	0	2	0.8
somewhat higher	3	4	3	10	4.1
no change	12	27	65	104	42.6
somewhat lower	22	14	29	65	26.6
much lower	13	14	26	53	21.7
bankruptcy	2	2	6	10	4.1
Total	53	62	129	244	100.0

Descriptive statistics for the sample used in the estimations are presented in Table 2.

Table 2. Descriptive statistics

Variable	Description	Mean	Std. Dev.	Min	Max	Num. Cases
Decreased turnover	=1 if owner believes that a general smoking ban would decrease turnover or make own business go bankrupt	0.51	0.50	0	1	252
Bar	=1 if bar, nightclub or bar/restaurant	0.21	0.41	0	1	252
Restaurant	=1 if restaurant or café/restaurant	0.53	0.50	0	1	252
Have outdoor seating	=1 if have outdoor seating	0.51	0.50	0	1	239
Lunch	=1 if many customers choose place for lunch and/or place is a lunch restaurant	0.60	0.49	0	1	252
Smoke free (from start)	=1 if true	0.12	0.33	0	1	252
Smoke free (previously allowed smoking)	=1 if true	0.09	0.28	0	1	252
Smoke free (currently)	=1 if true (either from start or previously allowed smoking)	0.21	0.41	0	1	252
Share of smoking customers		0.33	0.27	0	0.9	250
Non-smoking section	=1 if non-smoking section in restaurant	0.48	0.50	0	1	252
Saturday night	=1 if open after midnight	0.30	0.46	0	1	252
Investment made in less tobacco smoke	=1 if spent money	0.23	0.42	0	1	249
Vote against ban	=1 if vote against smoking ban at restaurants, bars and cafés compared to support, neutral and uncertain.	0.63	0.48	0	1	252
Property of air space belongs to owner	=1 if owner believes it is own decision to implement smoking ban and not authority	0.79	0.41	0	1	252
Non-paternalist owner	=1 if owner thinks that customers should be allowed to smoke if they want to	0.64	0.48	0	1	252
Sector recession	=1 if owner believes that an implementation of smoking ban will decrease the turnover for the whole restaurant sector	0.66	0.48	0	1	252
Tourist customers	=1 if tourist customers is one characteristic of the restaurant	0.28	0.45	0	1	236
Teenage customers	=1 if teenagers as customers is one characteristic for the restaurant	0.12	0.32	0	1	237

The average share of customers in the sample who smoke during restaurant visits is 33 percent. The level of dependence on smoking customers is measured by six categories: (0%, 0-20%, 21-40%, 41-60%, 61-80% 81-100%), from which we create a continuous

variable. The categories correspond to available alternatives in the questionnaire. Also, 12 percent have always been smoke free, and 9 percent have implemented bans, either voluntarily or according to regulation.[11] Of the responding establishments, 51 percent have outdoor seating, "lunch" is an important characteristic for 60 percent and 30 percent are open after midnight on Saturdays. Moreover, 48 percent have a non-smoking section and 23 percent have invested money in reducing tobacco smoke within the establishment.

In our sample, 79 percent believe that owners rather than a public authority should decide on smoking regulation in restaurants. Somewhat fewer, about two thirds of the respondents, think that customers should be allowed to smoke and would therefore vote against the proposed smoking ban, and 66 percent believe that a smoking ban would decrease turnover in the restaurant sector as a whole. See correlation matrix in Table A.6 in Appendix.

4 MODELING APPROACH

We use the owner's expected changes in turnover, y_i^*, measured by a six-grade scale for the individual business, i, provided that all restaurants, bars and cafés have to adapt to a smoking ban. Since the dependent variable has a logical ordering, an ordered response model with an underlying latent variable can be used (see e.g. Long 1997, ch.5):

$$y_i^* = \beta x_i + \varepsilon_i \tag{1}$$

where y_i^* theoretically, ranges from $-\infty$ to $+\infty$, x_i is a vector of explanatory variables and β is the corresponding parameter vector including the intercept. The measure used provides only incomplete information about the underlying y_i^*. The measurement equation can be described by:

$$y_i = m \text{ if } \tau_{m-1} \le y_i^* < \tau_m \quad \text{for } m = 1 \text{ to } J \tag{2}$$

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[11] In the "Smoke free (currently)" category, 42 establishments had a voluntary smoking ban while 12 had a smoking ban imposed on them since they were in a public building or an indoor public place such as a school or a shopping mall.

where $\tau's$ are cutpoints, which are unknown parameters estimated along with the $\beta's$.[12] There are too few owners responding with "much higher," which is a practical reason for merging this category with "somewhat higher." For partly the same reason, the category "bankrupt" is merged with "much lower." Moreover, it can be argued that the respondents in these two categories are *severely* hurt, so these two categories constitute one category. [13]

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y_i = \begin{cases} 1 \Rightarrow \text{'go bankrupt' or 'much lower' if} & \tau_0 = -\infty \le y_i^* < \tau_1 \\ 2 \Rightarrow \text{'somewhat lower' if} & \tau_1 \le y_i^* < \tau_2 \\ 3 \Rightarrow \text{'unchanged' if} & \tau_2 \le y_i^* < \tau_3 \\ 4 \Rightarrow \text{'somewhat higher' or 'much higher' if} \ \tau_3 \le y_i^* < \tau_4 = \infty \end{cases} \qquad (3)
$$

The probability that alternative m is chosen, is the probability that the underlying latent variable y_i^* falls between two cutpoints. If we assume that the underlying error structure is normally distributed ($\varepsilon \sim N(0,1)$), we have an ordered probit model with the following probabilities for the four observed outcomes:

$$
\begin{aligned}
\Pr(y_i = 1 \mid x_i) &= \Phi(\tau_1 - \alpha - \beta x_i) \\
\Pr(y_i = 2 \mid x_i) &= \Phi(\tau_2 - \alpha - \beta x_i) - \Phi(\tau_1 - \alpha - \beta x_i) \\
\Pr(y_i = 3 \mid x_i) &= \Phi(\tau_3 - \alpha - \beta x_i) - \Phi(\tau_2 - \alpha - \beta x_i) \\
\Pr(y_i = 4 \mid x_i) &= 1 - \Phi(\tau_3 - \alpha - \beta x_i)
\end{aligned} \qquad (4)
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where $\Phi(.)$ is the cumulative density function of the normal distribution. Naturally, a positive β_k implies that the latent variable y_i^* increases if x_{ik} increases. Following Long (1997), the effects of a discrete change for a dummy variable is calculated for each category by

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[12] The extreme categories, 1 and J, are defined as open-ended intervals.
[13] However, the ordered model can also be grouped as "bankrupt," "lower," "unchanged," and "higher." These are categories that mean the same for all respondents, while the difference between "somewhat lower" and "much lower" can mean different things for different respondents. See the next section and Footnote 15 for a short discussion on alternative specifications and their consequences on the results.

$$\frac{\Delta \Pr[y = m \mid x]}{\Delta x_i} = \Pr(y = m | x, \ x_i = 1) - \Pr(y = m | x, \ x_i = 0). \tag{5}$$

This gives us the predicted probability that $y = m$ given x, when x_i changes from 0 to 1, i.e. the predicted probability of outcome m changes by $\Delta \Pr(y = m \mid x)/\Delta x_i$, *ceteris paribus*. Marginal effects for continuous variables are calculated for each category by considering the effects of changes in the covariates on the probability of belonging to one particular cell, m, according to:

$$\frac{\partial \Pr[y = m \mid x]}{\partial x_i} = \{f[\mu(j-1) - \beta' x_i] - f[\mu(j) - \beta' x_i]\} * \beta_i \tag{6}$$

where $f(.)$ is the standard normal density, x_i is a vector of explanatory variables and β is the corresponding parameter vector. The sign of the marginal effect is not necessarily the same as the sign of the coefficient.[14]

5   RESULTS

We now turn to the analysis of owners' expected changes on turnover of a smoking ban. The owners were asked the following question*: "Imagine that all restaurants, bars, and cafés have to implement a smoking ban due to a new law. How do you think that your turnover would be affected?"* It was also mentioned that the suggested policy would only apply indoors, which is in line with the proposed smoking ban. The marginal effects for the ordered probit are presented in Table 3, while the parameter estimates are shown in the Appendix. The results are based on the categories: "bankrupt or much lower turnover," "somewhat lower turnover," "unchanged turnover," and "higher turnover." Each column for the ordered regression in Table 3 shows the predicted

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[14] If the dependent variable is ordinal and unidimensional, and the parallel regression assumption is met, then the ordered regression model can be used. However, one could for instance argue that the bankruptcy category is at another dimension than the others since bankruptcy implies that both costs and revenues are considered. If this is a serious problem, nominal models such as the multinomial logit should be used, where the independent variables are characteristics of the observed firm(s), not the choices. However, using multinomial logit when the dependent variable is ordinal implies a loss of efficiency (multinomial logit results available upon request).

probability of being in one of the four possible outcomes evaluated at sample mean of the explanatory variables.

Table 3. Changes in predicted probabilities of owners' expected effects of a general smoking ban on turnover.

Dependent variable	Ordered➔			
	bankrupt or much lower turnover	somewhat lower turnover	unchanged turnover	higher turnover
Smoke free (from start)	-0.169***	-0.271***	0.360	0.080
Smoke free (previously allowed smoking)	-0.130**	-0.190***	0.280	0.039
Share of smoking customers	0.305***	0.227**	-0.507***	-0.025
Non-smoking section	-0.097*	-0.072***	0.160	0.008
Bar	-0.017	-0.013	0.029	0.002
Restaurant	0.042**	0.032	-0.070	-0.004
Have outdoor seating	0.038*	0.029	-0.064	-0.003
Lunch	0.011	0.008	-0.018	-0.001
Saturday night	0.083***	0.051*	-0.128	-0.005
Property of air space belongs to owner	0.073***	0.069**	-0.134	-0.009
Non paternalist owner	0.017	0.013	-0.029	-0.002
Sector recession	0.213***	0.212***	-0.386***	-0.040*
Number of observations 232				
Log likelihood -209				
Restricted log likelihood -281				

*significant at the 10% level
**significant at the 5% level
***significant at the 1% level

The results show that the dependence on smoking customers and the beliefs on how the whole restaurant sector would be affected are, in terms of size and statistical significance, the most important variables for explaining expectations of changes in turnover. [15] Compared to those that currently allow smoking, establishments that have always been smoke-free have a 0.27 lower probability of expecting a somewhat lower turnover, while it is 0.19 lower among those that have implemented a smoking ban but previously allowed smoking. A similar pattern, although somewhat weaker, is apparent regarding the expectations of the "bankrupt or much lower turnover" category. Hence,

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[15] When merging "somewhat lower turnover" and "much lower turnover" and using "bankrupt" as the first category, the "non-smoking section" parameter lose significance. (see Appendix for comparisons) When running a regression without share of smoking customers, "bar" and "restaurant" are still insignificant, while the existence of a non-smoking section becomes significant. Also, the results do not change in any drastic way when merging "bar" and "restaurant," and more background characteristics are included. Finally, the econometric results are insensitive to whether the restaurants respond to the first or the second mailing.

those establishments that are smoke-free are less likely to expect negative economic effects due to a smoking ban compared to those that currently allow smoking. The results also show that the larger the share of smoking customers, the more likely the owner is to expect a somewhat lower turnover, and the expected effect in the category "much lower turnover or bankrupt" is even stronger. The probability of expecting no change in turnover is lower as the share of smoking customers decreases. The results also show that if an establishment has a non-smoking section, it is less likely to expect financial losses due to a smoking ban, while the existence of a non-smoking section has no significant effects in the "unchanged" and "higher turnover" categories. Hence, the general pattern is that establishments that have smoking bans or have a relatively small proportion of smoking customers, are less likely to expect financial loss from an introduction of a smoking ban.

Owners' expected effects must be separated from actual effects. This paper resembles Dunham and Marlow (2000a-b), looking at expectations rather than actual effects and allowing for an investigation of distributional effects at the firm level. Direct comparisons are hence easier to make with these studies. Our study shows that owners are more likely to *expect* turnover to decrease if they cater to relatively many smokers. This is in line with Dunham and Marlow (2000b), even though they, seem to a larger extent, rely upon the assumption that owners' expectations also reflect what will actually happen to turnover.

Somewhat surprisingly (cf. Table 1), our results indicate that the type of establishment does not exhibit any strong effect on owners' expected changes in turnover (however, note that restaurants have a 0.04 higher probability of expecting "much lower turnover or bankruptcy" compared to cafés). Casual observations would suggest that bars and nightclubs would face larger problems compared to many cafés and that restaurants, and smokers visiting bars and nightclubs typically have stronger smoking preferences compared to when they visit restaurants and cafés. However, it can be seen that establishments that stay open after midnight on Saturdays (compared to being closed) perceive a slightly increased risk of expecting financial loss. Moreover, when excluding late night open hours from the regression, "bars" and "restaurants" expect an increased risk of going bankrupt and expect much less turnover. Even though the proposed ban would only apply indoors, the existence of outdoor seating does not in

any major way affect the expected turnover (note however the small effect in the category "much lower turnover or bankrupt"). This is possibly due to the Gothenburg climate characterized by a relatively short outdoor season. The "lunch" variable is insignificant, indicating that there are no significant differences in expected changes in turnover associated with this niche.

The parameter of "sector recession" shows an increased probability of expecting own financial loss if an owner thinks the whole restaurant sector will lose turnover due to a general smoking ban, while it decreases the probability of expecting unchanged or higher turnover. Naturally, one should not rule out that the respondents rationalize their answers, i.e. if an owner expects own financial losses, he/she tends to also answer that the whole sector would be negatively affected.[16]

There are several possible assumptions one can make, on an individual level as well as on a sector level, regarding the changes in customers behavior resulting from a smoking ban. These assumptions can help explain the pessimism among owners regarding the economic performance following an implementation of a smoking regulation. One may, for example, assume that a ban would make smokers eat and drink less frequently at these establishments, spend less money per visit and maybe use substitutes (illegal places and stay at home). One may also wonder whether or not a ban would really make non-smokers increase their spending in the restaurant sector. On the aggregate level, this pessimism might be overestimated if the results of Glantz and Smith (1997), who find no decreases in revenues due to a smoking ban, were valid in Sweden as well. Also, anecdotal evidence from the California Department of Health Services suggests that a growing majority of California bar patrons supports the change to a smoke-free environment, indicating that the pessimism of smoke-free restaurants might be overestimated.[17]

The parameter for "property of air space belongs to owner" is positive and significant when an owner expects "somewhat lower" or "much lower or bankruptcy", showing that private ownership of establishment air space is more important when expecting financial losses. When excluding "sector recession," "property of air space

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[16] This result is also consistent with the "false consensus effect", i.e. that people tend to think that others are just like them.
[17] State Health Director Kim Belshé, http://www.dhs.ca.gov/opa/prssrels/1998/X1-98.htm

belongs to owner," and "non-paternalist owner" from the regression, the results do not change in any major way.[18]

5.1 *NETWORK EXTERNALITIES*

One interesting question is whether owners' expectations of the effects of a smoking ban on turnover are conditional upon whether other establishments have smoking bans or not, i.e. the importance of network externalities (e.g. Katz and Shapiro 1986). Hence, we also asked what would happen if only the individual restaurant implemented a smoking ban while the other establishments did not change their behavior. Table 4 shows the responses those establishments that currently allow smoking.

If we assume that the restaurant market is in equilibrium regarding the share of smoke-free establishments before a smoking ban, we would expect firms to lose more if they were alone in implementing a smoking ban compared to if all establishments were imposed a general ban. It is generally very difficult to correctly assess the importance of network externalities, and hence the general equilibrium effects. Owners of establishments in the restaurant sector can have trouble appreciating the differences between a general ban and a ban that only affects their own businesses. It is the latter they have some expertise in. When they try to pass from the level of the individual restaurant to that of the whole sector, their judgement may be quite misleading.

Table 4. Comparison between owners' expected effects of a smoking ban on turnover from a general smoking ban and if only an individual establishment would implement a smoking ban (only establishments that currently allow smoking).

			Expected turnover due to a general smoking ban					
		Total	much higher	somewhat higher	no change	somewhat lower	much lower	bankruptcy
	much higher	**0**	0	0	0	0	0	0
Expected turnover if only "your" restaurant would implement a smoking ban	somewhat higher	**4**	0	0	4	0	0	0
	no change	**27**	0	1	22	2	1	1
	somewhat lower	**48**	0	1	21	22	4	0
	much lower	**84**	0	1	18	34	31	0
	bankruptcy	**31**	1	0	2	5	13	10
	Total	**194**	**1**	**3**	**67**	**63**	**49**	**11**

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[18] Essentially, the expected effects of non-attitude variables on turnover are the same whether the attitude variables (including "sector recession") are included or not, indicating that attitude variables add to explanatory power, but does not bias other effects. However, the (absolute) size of the parameters controlling for dependence of smoking customers and the "smoke free" variables is slightly higher in the "bankrupt and much lower turnover" category, and slightly lower in the "somewhat lower turnover" category, compared to when attitude variables are included.

As shown in Table 4 (in the gray diagonal), almost half (44 percent) do not expect any turnover difference between a general and an individual ban. However, others do state that they would be worse off implementing an individual smoking ban compared to a general one, as shown by the higher numbers in the lower triangular area (compared to the upper triangular area). In particular, 97 (50 percent) out of 194 are relatively better off with a general smoking ban compared to them taking their own initiative. Only 12 (6 percent) are better off with an individual smoking ban. Four establishments out of these 12 expect "somewhat higher" turnover from implementing an individual smoking ban, while expecting "no change" from a general ban. Also, 67 establishments expect no change in turnover from a general smoking ban, while only 27 expect no change if they were to implement a ban alone. No establishment expects "much higher" turnover. In sum, this clearly shows that the owners, as expected, take other establishments actions into consideration and would, at the margin, be more hesitant to take own, voluntary, initiative regarding a smoking ban. Also, given that the market for smoke-free establishments is at least close to equilibrium, it is expected that most establishments would be worse off with an individual smoking ban. However, as the high numbers in the gray diagonal and the 12 observations in the upper triangular area indicate, owners seem to not sufficiently acknowledge general equilibrium effects.

5.2 *Reconciling actual and expected effects of a smoking ban*

Possible explanations that could reconcile the evidence of actual effects on an aggregate level with the expected effects on a firm level is first that owners weigh smoker preferences regarding the opportunities to smoke too heavily, and second that owners have an inability to appreciate general equilibrium effects. Since many firms perceive a great value in their right to allow smoking, it is natural to hypothesize that there is significant resistance in terms of voter support. From a Coasian perspective (Coase, 1960) the ownership of restaurant air space is shifted from the owner if a smoking ban is implemented by the government.[19] There could also be strategic or attitudinal (hard to

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[19] Boyes and Marlow (1996) argue that owners cater to customer preferences and thereby internalize externalities of environmental tobacco smoke, and argue that a smoking ban imposed by public authorities misallocates air space shared by smokers and non-smokers.

separate) explanations for smoking ban resistance. For instance, is the Coasian solution, relying on owners catering to customer preferences, or a more interventionistic policy preferred from the restaurant business perspective?

A probit model is estimated to describe how the probability of voting against a general smoking ban depends on different variables including background characteristics, expectations on turnover in the whole restaurant sector and attitudinal variables. The owner was asked the following question: *"How would you vote if the following policy were suggested? Ban smoking in cafés, bars and restaurants."* The responses available were *"Vote against," "Neutral," "Vote for,"* and *"Don't know."* In Table 5, the marginal effects are presented for the probability of voting against a proposed indoor smoking ban (parameter estimates in Appendix). [20]

Table 5. Direct, indirect and total changes in predicted probabilities of owners voting against a smoking ban.

	Direct effect[a]		Indirect effect[b]		Total marginal effect[c]	
		p-value		p-value		p-value
Constant	-0.871	0.000	-0.033	0.000	-0.904	0.000
Decreased turnover	0.174	0.067				0.074
Smoking ban (currently)	-0.077	0.623	-0.066	0.027	-0.143	0.161
Share of smoking customers	0.097	0.661	0.127	0.000	0.224	0.124
Non-smoking section	-0.063	0.526	-0.014	0.347	-0.077	0.374
Bar	0.328	0.000	0.023	0.315	0.351	0.005
Restaurant	0.254	0.012	0.002	0.932	0.256	0.020
Have outdoor seating	-0.084	0.311	-0.002	0.893	-0.086	0.319
Lunch	-0.033	0.724	0.005	0.743	-0.028	0.818
Saturday night	0.174	0.109	0.023	0.237	0.197	0.079
Property of air space belongs to owner	0.513	0.000				0.000
Non paternalist owner	0.190	0.075				0.075
Investment made in less tobacco smoke	0.067	0.510				0.510
Tourist customers	0.033	0.754				0.754
Teenage customers	0.207	0.096				0.096
Sector recession	0.293	0.003				0.003
Number of observations	224					
Log likelihood	-77.50					
Restricted log likelihood	-146.57					

a Direct effect $= \partial \Pr(vote) / \partial x_i$

b Indirect effect $= \partial \Pr(vote) / \partial turnover * \partial \Pr(turnover) / \partial x_i = 0.174 * \partial \Pr(turnover) / \partial x_i$

c Total effect = direct+indirect effect

[20] In order to see the indirect marginal effect of share of smokers on the probability of voting against a smoking ban, we also estimate the probability of expecting a decreased turnover, i.e. y^* equals one if an owner expects bankruptcy or decreased turnover. Parameter estimates and marginal effects of this regression are in the Appendix.

If the owner expects a decrease in turnover, the probability of voting against the proposed ban increases by 0.17. There is, however, no significant direct effect of the share of smoking customers on voting behavior. However, since turnover is a function of the share of smokers, there is an indirect effect of 0.13, which gives us a total marginal insignificant effect of 0.22. However, the effect of an expected decreased turnover on the resistance to a general smoking ban is surprisingly small and only significant at the 10% level. From a profit maximizing perspective, the expected effects on profit should be the only matter of interest for owners, but in Table 5 "sector recession" "property of air space" and "non-paternalist owner" also contribute to the understanding of the resistance to a general smoking ban.

A respondent believing that the "property of air space belongs to owner," rather than believing public authorities should decide on smoking bans, has an increased probability of voting against a ban by 0.51.[21] This result is in line with Boyes and Marlow (1996) and Dunham and Marlow (2000a) in that owners allocate air space according to customer preferences. Furthermore, if owners think that their customers should be allowed to smoke ("non-paternalistic") in their establishments if they want to, the probability of voting against a ban increases by roughly 0.19. Also, a smoking ban expected to decrease overall turnover in the restaurant sector ("sector recession") increases the probability of owners voting against the policy. However, it seems strange that owners are less concerned with their own turnover than with the sector turnover. Since owners' expectations of their own turnover is correlated with expectations of sector turnover ($\rho = 0.50$) the results could be affected by this. In fact, if one removes "sector recession," the direct marginal effect of own turnover increases to 0.25 (consequently, the indirect effects would also be higher) and is statistically significant at the 1% level. Moreover, if the variables "property of air space" and "non-paternalism" are also removed, the direct marginal effect increases further to 0.36.

Furthermore, bars are the type of establishment most likely to resist a smoking ban, followed by restaurants that are slightly less negative than bars, which might reflect

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[21] Note that removing "property of air space" does not affect the other parameters in any major way, even though it could be hypothesized that this variable measures more or less the same thing as the dependent variable (correlation coefficient between these two is 0.53). Note also that some establishments (22 percent) would prefer a governmentally imposed smoking ban. Some of these responses point to fairness of competition (arguments from those that involuntarily have a smoking ban), and some argue that it would be easier to defend a ban to customers.

differential effects. This is in line with casual observations that suggest that bars cater to smoker preferences more than other establishments. Dunham and Marlow (2000b) stress that studies at aggregate levels do not uncover differential effects among establishments. For example, bankruptcy at the firm level will not be detected in an aggregate analysis, even though it is a possible outcome of a smoking ban. Note again that owners' expectations of changes in turnover must not necessarily reflect what would actually happen.

Note also that owners of establishments with teenaged customers, this show an increased probability of voting against a ban. Investments to decrease smoke and the availability of a non-smoking section could imply a competitive advantage if the smoking ban is *not* introduced. However, we find no significant effect of these characteristics. Moreover, we find no significant effects of the existence of outdoor seating, of whether the restaurant has customers who typically visit for lunch or of whether the establishment is open after midnight.

Finally, note that comparisons with regulations in other countries regarding resistance to smoking bans should ideally also account for who is liable if regulations are not met - customer, employee or owner. For instance, resistance to a smoking ban would probably increase among owners if they knew they would be liable for violations. On the other hand, if only the customers were liable for violations, resistance to a smoking ban would increase among customers.

6 CONCLUDING REMARKS

The descriptive statistics show that a majority of respondents, 52 percent, expect lower turnover or bankruptcy from the implementation of a smoking ban, while 42 percent expect no changes and 5 percent expect an increase in turnover. An alternative presentation, depending on how owner responses are interpreted, would be that 74 percent of establishments would not be severely hurt by a general smoking ban. Clearly, the interpretation of these "simple" statistics is crucial and difficult, and the policy implications are not straightforward. This study relies on owners' expectations, and saying that the results also reflect what would actually happen is of course troublesome. However, this study draws some tentative conclusions. The study also directs attention to questions for further research.

The econometric results show that the dependence on smoking customers and beliefs on how the whole restaurant sector would be affected are in terms of size and statistical significance, the most important variables for explaining expectations of changes in turnover. The econometric results further show that the probability of expecting a decrease in turnover is higher the larger the share of smoking customers is. Accordingly, a decrease in smoking participation in general affects the share of smoking customers, and probably in addition owners' expected effects of a general smoking ban on turnover. Furthermore, compliance and support for a general smoking ban can also be hypothesized to increase the smaller the share of smoking customers is.

Owners' perceptions of the whole restaurant sector turnover is important when explaining owners' expectations of changes in their own turnovers. Beliefs that the whole sector would lose turnover also affects the probability of expecting own financial losses. The results also indicate that excluding the perception of sector turnover does not qualitatively change the effects of other variables. Hence, on a speculative note, experiences from other countries translated and fruitfully communicated to restaurant owners in Sweden, *might* affect expected changes in turnover positively, and hence also weaken the resistance to a general smoking ban.

Moreover, and quite interestingly, establishments that do not currently allow smoking are less likely to expect a decrease in turnover due to a general smoking ban compared to those who currently allow smoking. This result is not self-evident. Establishments that already ban smoking can either lose from a ban (i.e. lose their niche) or they can profit from a ban if they currently perceive a competitive disadvantage from other establishments that currently allow smoking. Hence, the results from this study show that owners of the non-smoking establishments do expect to lose from a new regulation, even though the losses are expected to be less likely to occur compared to businesses currently allowing smoking.

The results also show that there is, having asked owners in the restaurant sector, a distributional dimension at the firm level. Owners of bars and restaurants *or* establishments that are open late on "Saturday nights" are more likely to expect to be severely hurt (expect much lower turnover or bankruptcy) by a general smoking ban than cafés. Establishments with these characteristics are also found to be more likely to vote against a smoking ban.

Whether owners' expectations of effects on turnover translate into actual effects remains to be seen. However, this study finds some evidence that could reconcile the different conclusions drawn by previous studies on actual (Glantz and Smith 1997) and expected (Dunham and Marlow 2000b) effects of a smoking ban on turnover. The common difficulty in projecting general equilibrium effects is of course also valid for owners of establishments in the restaurant sector, and this might bias their predictions. Strictly speaking, the results in this study cannot be said to confirm that owners are overly pessimistic and that owners cannot appreciate general equilibrium effects. However, a considerable fraction of respondents do not expect any difference (or even expect to be better off with an individual ban compared to a general smoking ban) in changes in turnover between an individual smoking ban and a general ban, which indicates that many owners do not take general equilibrium effects into account. Note however that this conclusion is tentative, and needs to be further investigated. For instance, one would like to know more about how restaurant owners expect smoking and non-smoking customers to change their behavior under different smoking regulation scenarios, and in different time perspectives.

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APPENDIX

EFFECTS ON TURNOVER OF A GENERAL SMOKING BAN
Table A.1. Parameter estimates for Table 3

	Coeff.	Std.Err.	t-ratio	P-value
Constant	2.455	0.397	6.177	0.000
Smoke free (from start)	1.260	0.413	3.051	0.002
Smoke free (previously allowed smoking)	0.856	0.324	2.640	0.008
Share of smoking customers	-1.336	0.449	-2.975	0.003
Non-smoking section	0.427	0.186	2.291	0.022
Bar	0.076	0.298	0.255	0.799
Restaurant	-0.185	0.199	-0.927	0.354
Have outdoor seating	-0.168	0.177	-0.947	0.344
Lunch	-0.048	0.180	-0.269	0.788
Saturday night	-0.339	0.254	-1.338	0.181
Property of air space belongs to owner	-0.358	0.273	-1.312	0.190
Non-paternalistic owner	-0.077	0.202	-0.379	0.705
Sector recession	-1.129	0.231	-4.894	0.000
Mu(1)	1.134	0.133	8.498	0.000
Mu(2)	3.539	0.227	15.624	0.000

EFFECTS ON TURNOVER OF A GENERAL SMOKING BAN
Alternative specification (compare with Table 3), *other category merging*
Table A.2. Changes in predicted probabilities of owners' expected effects of a general smoking ban on turnover.

	Ordered➜			
Dependent variable	bankrupt	less turnover	unchanged turnover	higher turnover
Smoke free (from start)	-0.013	-0.310[***]	0.258	0.065
Smoke free (previously allowed smoking)	-0.009	-0.203[**]	0.180	0.033
Share of smoking customers	0.056[**]	0.745[***]	-0.727[***]	-0.074
Non-smoking section	-0.003	-0.036	0.036	0.004
Bar	0.004	0.047	-0.047	-0.004
Restaurant	0.005[**]	0.068	-0.066	-0.007
Have outdoor seating	0.002	0.029	-0.029	-0.003
Lunch	0.002	0.029	-0.028	-0.003
Saturday night	0.011[***]	0.126	-0.126	-0.011
Number of observations	232			
Log likelihood	-180			
Restricted log likelihood	-226			

*significant at the 10% level
**significant at the 5% level
***significant at the 1% level

EFFECTS ON TURNOVER OF A GENERAL SMOKING BAN
Alternative specification (compare with Table 3), *same category merging without attitudes*.
Table A.3. Changes in predicted probabilities of owners' expected effects of a general smoking ban on turnover

	Ordered➜			
Dependent variable	bankrupt and *much* lower turnover	somewhat lower turnover	unchanged turnover	higher turnover
Smoke free (from start)	-0.205***	-0.211***	0.297	0.119**
Smoke free (previously allowed smoking)	-0.149***	-0.132***	0.225	0.056***
Share of smoking customers	0.454***	0.209***	-0.598***	-0.065
Non-smoking section	-0.104**	-0.048***	0.136	0.016***
Bar	-0.004	-0.002	0.005	0.001
Restaurant	0.038	0.018	-0.050	-0.006
Have outdoor seating	0.042*	0.020	-0.056	-0.006
Lunch	0.018	0.008	-0.024	-0.003
Saturday night	0.090***	0.034*	-0.113	-0.011
Property of air space belongs to owner				
Non-paternalistic owner				
Sector recession				
Number of observations	232			
Log likelihood	-209			
Restricted log likelihood	-281			

*significant at the 10% level
**significant at the 5% level
***significant at the 1% level

EFFECTS ON TURNOVER OF A GENERAL SMOKING BAN
Table A.4. Parameter estimates and marginal effect for Table 5
y=1 if expecting decreased turnover of smoking ban

	parameter estimate	marginal effect	p-value
Constant	-0.469	-0.187	0.213
Smoking ban (today)	-1.023	-0.381	0.001
Share of smoking customers	1.832	0.729	0.000
Smoking section	-0.209	-0.083	0.321
Bar	0.338	0.133	0.316
Restaurant	0.021	0.009	0.933
Have outdoor seating	-0.026	-0.010	0.894
Lunch	0.072	0.029	0.745
Saturday night	0.333	0.131	0.194
Number of observations	224		
Log likelihood	-114.89		
Restricted log likelihood	-154.83		

Table A.5. RESISTANCE TO SMOKING BAN
Parameter estimates for Table 5
Binary, Vote against smoking ban=1

	Coeff.	P-value
Constant	-2.480	0.000
Decreased turnover	0.494	0.071
Smoking ban (today)	-0.214	0.613
Share of smoking customers	0.275	0.662
Non-smoking section	-0.180	0.528
Bar	1.192	0.007
Restaurant	0.727	0.013
Have outdoor seating	-0.240	0.313
Lunch	-0.095	0.726
Saturday night	0.527	0.143
Property of air space belongs to owner	1.400	0.000
Non-paternalistic owner	0.524	0.072
Investment made in less tobacco smoke	0.197	0.509
Tourist customers	0.094	0.754
Teenage customers	0.705	0.094
Sector recession	0.807	0.003

Table A.6. Correlation matrix

	Decreased turnover	Smoking ban (today)	Share of smoking customers	Non-smoking section	Bar	Restaurant	Have outdoor seating	Lunch	Saturday night	Property of air space belongs to owner	Non-paternalist owner	Tourist customers	Teenage customers	Sector recession	Vote against ban
Decreased turnover	1.00														
Smoking ban (today)	-0.47	1.00													
Share of smoking customers	0.51	-0.66	1.00												
Non-smoking section	0.14	-0.49	0.26	1.00											
Bar	0.23	-0.15	0.19	0.02	1.00										
Restaurant	-0.12	-0.01	-0.19	0.11	-0.57	1.00									
Have outdoor seating	0.08	-0.08	0.10	-0.06	0.14	-0.17	1.00								
Lunch	-0.07	0.03	-0.09	0.10	-0.24	0.30	-0.03	1.00							
Saturday night	0.30	-0.29	0.30	0.09	0.55	-0.19	0.16	-0.23	1.00						
Property of air space belongs to owner	0.33	-0.13	0.13	0.03	0.07	0.03	0.06	-0.06	0.12	1.00					
Non-paternalistic owner	0.40	-0.52	0.42	0.27	0.20	-0.04	0.04	-0.12	0.27	0.45	1.00				
Tourist customers	0.07	-0.07	0.14	0.12	-0.09	0.07	0.09	0.16	-0.02	0.08	0.02	1.00			
Teenage customers	0.00	0.00	0.03	-0.08	-0.09	-0.04	0.09	0.07	-0.16	0.02	-0.05	0.41	1.00		
Sector recession	0.50	-0.17	0.28	0.05	0.11	-0.14	0.02	0.00	0.10	0.43	0.27	0.10	0.06	1.00	
Vote against ban	0.46	-0.36	0.33	0.13	0.26	-0.03	0.05	-0.11	0.32	0.53	0.50	0.10	0.08	0.46	1.00