Office of TOBACCO CONTROL

Smoke-Free Policies

Market Research and Literature Review on Economic Effects on the Hospitality Sector

Commissioned by the Office of Tobacco Control

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ISBN: 0-9541491-4-9

Table of Contents

Background

The Minister for Health and Children, Micheál Martin TD, has announced his intentions, for public health reasons, to ban smoking in all enclosed workplaces, including bars and restaurants. This decision gave rise to some concerns within the hospitality industry, in particular, where it was feared that the ban could have an adverse effect on business.

In addressing this question the Office of Tobacco Control (OTC) commissioned two reports: one from a leading market research company, which assessed Irish people's future intentions regarding their visits to bars following the ban (the market report); and a second report from two independent economists who were asked to critically review the published literature on the experience of other countries who had introduced similar bans (the economic report). The independent economists also considered the limited number of reports published in Ireland on the matter. Both these reports are published in this document. The more recently published data from New York city, which shows an increase in tax revenue of 12% from the hospitality sector in the first six months after the introduction of a ban on smoking in that city, was not available at the time the reports were being prepared.

Economic theory suggests that some customers will react positively, and others negatively to the ban. Equally, proprietors can adjust their product to accommodate changes in the market. The economic question to be considered, therefore, is whether there will be a net loss or net gain from these changes. The market report concludes that the proposed ban is not expected to have an adverse effect on the hospitality sector as a whole and may, in fact, have a positive effect. The economic report concludes that there is no evidence of any adverse effect on business in the literature reviewed. (It is, of course, not possible to assess in advance the likely impact on individual businesses). Based on this evidence, the Office of Tobacco Control is of the view that the workplace smoking ban is unlikely to have an adverse economic effect on the hospitality business and may in fact have a positive effect.

Attitudes To Smoking In Pubs and Restaurants

A Research Report by TNS mrbi

1. Background

The Office of Tobacco Control (OTC) was established on a statutory basis on 31 May, 2002. The remit of the OTC is to support the Government policy of promoting a tobacco free society by fulfilling the functions set out in the Public Health (Tobacco) Act, 2002.

To assist in these duties, a programme of market research has been established, to inform the OTC on consumer attitudes towards smoking and smoking behaviour.

1.1 FOCUS OF THIS REPORT

This report focuses on attitudes towards smoking in pubs and bars, looking specifically at:

- Attitudes towards smoking controls in general.
- Likely impact on visiting pubs/bars if smoking was not allowed.
- Incidence of having ever left or chosen not to go into a pub or restaurant because of tobacco smoke.

1.2 SOURCES OF INFORMATION USED

The initial findings from this report are drawn from a National Survey of Attitudes and Opinions. Interviews were conducted on a face-to-face basis in the home of the respondent. The defined universe for this survey was all aged eight years and upwards living in the Republic of Ireland.

Findings relating to smoking in pubs/bars and restaurants are drawn from a National Telephone Survey of Irish adults aged fifteen years and upwards.

1.3 RESEARCH METHODOLOGY – NATIONAL SURVEY OF ATTITUDES & OPINIONS – 8 YEARS & UPWARDS (2002)

1.3.1 How the respondents were selected

Firstly, the population was stratified by four main regions – Dublin, Rest of Leinster, Munster and Connaught/Ulster. Within these regions, the population was further divided into urban and rural. DEDs (District Electoral Divisions) were then chosen using standard market research sampling procedures. This DED is the primary sampling point.

The second stage involved selecting individuals for interview within each primary sampling point. For each sampling point, the relevant Register of Electors was identified from which one address was randomly selected. It is at this address that the interviewer must commence interviewing. The interviewer then follows a random route procedure, whereby they call at every fifth household in urban areas and every quarter of a mile in rural areas to fulfil their quotas.

1.3.2 Sample size & structure

A nationally representative sample of 1,503 people (8+ years) was achieved. Contained within this total of 1,503 interviews is a core sample of 1,012 interviews with a sample of the population aged 8 years and upwards, and a booster sample of 491 interviews with 8 to 17 year olds. The purpose of the booster was to obtain a robust representation of people aged 8 to 17 years.

After combining the main and booster samples, data weighting was applied to ensure that the demographic profile of the sample was aligned to that of the total population aged 8+ years.

The table below shows the data before and after weighting. The actual population estimate of 3.21 million people is taken from the 1996 Census and used for weighting purposes. The sample was also weighted by day of week of interviewing. All of the findings are stated in percentage terms as a percentage of the national weighted population.

	Sample Unweighted 1,503 people	Sample Weighted 3.21 million people (National Population from 1996 CSO Census)
Age group		
8-17	726	656,000
18-24	113	420,000
25-44	307	1,016,000
45-64	240	704,000
65+	108	414,000
Refused	9	–
Total	**1,503**	**3,210,000**
Sex		
Male	741	1,637,000
Female	762	1,573,000
Total	**1,503**	**3,210,000**
Social Class		
ABC1F1	672	1,445,000
C2DEF2	803	1,765,000
Refused	28	–
Total	**1,503**	**3,210,000**

1.4 RESEARCH METHODOLOGY – NATIONAL TELEPHONE SURVEY OF ADULTS – 15 YEARS & UPWARDS (2003)

In 2003, a nationally representative sample of adults were asked questions relating specifically to their attitudes towards smoking in pubs/bars and restaurants.

Interviews were conducted amongst 1,000 adults aged 15 years and upwards via CATI (Computer Aided Telephone Interviewing). Telephone numbers were generated via random digit dialling (RDD) to ensure ex-directory landline telephone numbers were included.

Quota controls by gender within age, gender within social class and region were imposed with standard statistical weighting procedures applied at the analysis stage to further define the sample profile.

	Sample Unweighted	Sample Weighted*
Age group		
15-24	215	226
25-34	185	189
35-44	177	181
45-54	156	153
55+	267	252
Total	**1,000**	**1,000**
Sex		
Male	483	493
Female	517	507
Total	**1,000**	**1,000**
Social Class		
ABC1	420	375
C2DE	460	506
F	120	120
Total	**1,000**	**1,000**

* *All weighted totals are shown as 1,000 even though the figures may add to +/– 1 either way due to weighting.*

2. Findings

From the National Survey of Attitudes and Opinions (2002) we know that both smokers and non-smokers recognise the health effects and social unacceptability of smoking. For example, most smokers have tried to give up and most smokers still want to give up. However, the strength of public feeling against smoking is most manifest in the level of support for initiatives to control smoking in public places. Even the ban on smoking in hairdressing salons and barbershops, which when researched received the lowest level of public support, is supported by 84% of the Irish population. Furthermore, majority support is forthcoming from both smokers and non-smokers for a range of initiatives to discourage young people from smoking, including doubling the space allocated to health warnings on cigarette packs and doubling the fines to anybody selling cigarettes to underage smokers.

How the public's attitude towards smoking in public places translates to pubs/bars and restaurants was examined via a National Telephone Survey of Adults (2003). From this phase of research three clear findings emerge.

Firstly, the frequency of visiting a pub/bar to eat would increase if smoking was not allowed – 20% of adults say they would visit more often, versus just 7% believing they would visit less often.

Secondly, visiting pubs/bars to drink would be unaffected by a smoking ban – the 12% of adults claiming they would visit less often is more than offset by the 13% of adults expressing the view that they would visit more often.

Obviously, the intentions of smokers and non-smokers differ, with non-smokers expressing the view that they would be more inclined to visit if the ban was introduced, whereas smokers expect they would be less inclined to visit.

Thirdly, one in three (35%) adults have left or chosen not to go into a pub or restaurant because of tobacco smoke. This increases to 42% when we look at non-smokers only, although a significant proportion of smokers (16%) also claim to have left a smoky pub or restaurant on some occasion in the past.

In conclusion, smokers and non-smokers accept that smoke-free public places are desirable and, across the population as a whole, the research indicates that the impact of a smoking ban on the number of visitors to pubs and restaurants will be neutral to positive.

WHERE SHOULD SMOKING BE BANNED?

Base: All aged 18+ years

	Total (777) %	Smokers (266) %	Non-Smokers (511) %
Pre-schools/crèches/day-nurseries	98	97	98
Grocery retail outlets	97	95	97
Doctors & dentists waiting rooms	96	96	96
Commercial kitchens & food preparation areas	96	94	98
Hospitals & other health care facilities	93	90	94
Cinemas, theatres & concert halls	92	86	96
Public areas in financial institutions	92	91	93
State-owned art galleries, museums etc.	91	86	94
Schools, universities & colleges	90	83	93
Public areas in all Government buildings	89	83	92
Public transport & public transport waiting areas	89	80	94
Indoor sports & leisure centres	87	76	93
Hairdressing salons & barbershops	84	71	91

ATTITUDES TO INITIATIVES TO DISCOURAGE YOUNG PEOPLE FROM SMOKING?

Base: All aged 18+ years

	Total (777) %	Smokers (266) %	Non-Smokers (511) %
Double the fines for anybody selling cigarettes to underage smokers	91	85	93
Introduce licensing for tobacco products, so that shops selling to underage smokers could have their licences revoked	85	79	88
Ban product placement, i.e. cigarette companies paying for their brand to be shown in movies or on TV	79	70	83
Ban actors from accepting payment to smoke in public	74	64	79
Ban all forms of advertising, including sports sponsorship	76	67	82
Double the amount of money allocated to anti-smoking advertising	73	62	78
Double the space allocated to health warnings on cigarette packets	76	65	82
Raise the legal minimum smoking age from 16 to 18	72	64	77
Include pictures of smoking related diseased organs on cigarette packets	71	57	78
Ban the sale of cigarettes in packs of less than 20	65	49	73
Raise the legal minimum smoking age from 16 to 21	62	53	67
Ban the use of the term ‘mild’ or ‘low tar’ on cigarettes	60	44	67
Double the price of cigarettes overnight	63	46	72
Impose a custodial/prison sentence for anybody selling cigarettes to underage smokers	54	50	56

FREQUENCY OF VISITING PUBS/BARS TO EAT IF SMOKING WAS NOT ALLOWED

Base: All aged 18+ years

	Total (936) %	Smokers (238) %
More often than you do nowadays	20	6
Less often than you do nowadays	7	22
As often as you do nowadays	63	59
Never visit	9	13
Don’t know	1	–

FREQUENCY OF VISITING PUBS/BARS TO DRINK IF SMOKING WAS NOT ALLOWED

Base: All aged 18+ years

	Total (936) %	Smokers (238) %
More often than you do nowadays	13	1
Less often than you do nowadays	12	38
As often as you do nowadays	64	46
Never visit	10	14
Don’t know	1	1

The Impact of Smoke-Free Policies on the Hospitality Sector

A Review of the Literature by J. Durkan and M. McDowell

Terms of Reference

The authors were asked to critically evaluate the methodology and findings of studies, which were the subject of an extensive literature review conducted by the VicHealth Centre for Tobacco Control (the Scollo report) on the economic effects of prohibiting smoking in the hospitality sector. The authors also undertook to review relevant reports published subsequent to the Scollo report. In their report, the authors were asked to consider what lessons could be drawn from this review regarding the possible economic impact of the forthcoming ban on smoking in the Irish hospitality sector.

Executive Summary

- The objective of this study is to examine the likely economic impact on the hospitality sector in Ireland of the introduction of smoke-free policies, by considering the evidence from other jurisdictions. Hence the study is a review rather than new primary research.
- Recent research shows that 25% of the adult population regularly smoke cigarettes. For smokers who drink alcohol, smoking and drinking are complements, so that a smoking ban may lead to a reduction in alcohol and food consumption by them in pubs and restaurants. For non-smokers, smoking in pubs and restaurants reduces their benefits from frequenting pubs and restaurants, (indeed some may rarely frequent pubs for this reason and seek out the non-smoking sections in restaurants), so that a smoking ban may increase their demand. The net effect is what matters.
- Ex ante, it is impossible to predict what that net effect might be. Hence there is a need to look at work elsewhere.
- Two research approaches have been adopted elsewhere: one based on subjective data, mainly ex ante surveys of expectations and intentions; while the other relies on objective data from before and after the introduction of smoking bans.
- A major study (the Scollo report) has already been done covering approximately 100 research papers. This work is important in listing, classifying and analysing studies. In the report, studies based on subjective data are treated as suspect, as were those not published in peer reviewed journals or those financed by the tobacco industry. Studies based on objective data were deemed more likely to be useful.

- The conclusion of the Scollo report was that "policy makers could proceed with smoke-free regulations secure in the knowledge that there would be no adverse business impact".
- Detailed analysis of some of the papers listed in this study lead us to a more conservative conclusion: that there is little statistical evidence to support the proposition that a smoking ban in Ireland would significantly reduce sales in the hospitality sector.
- The models based on objective data are mainly ad hoc in nature and not based on the optimising behaviour of economic agents. There is poor reporting of statistical tests on the coefficients in estimated equations. The results take no account of the likely reaction of business to proposed bans. The models look at pre and post ban data on sales (or some similar variable), but these could have been influenced by suppliers' reactions to the ban.
- The current study concludes that:
  - The impact of a ban is unlikely to be uniform across all establishment types or all types of outlet.
  - The weight of evidence, even if studies are imperfect, is that bans have little or no effect in aggregate. This same result is seen from different data sets, different time periods and different locations.

1. Introduction

Smoke-free policies have been adopted by many countries around the world and by several states in the US. The introduction of such policies has encountered some resistance, both from the tobacco industry, which fears a further decline in its market base, and by the hospitality sector concerned about the impact of a smoking ban on business. Because of the importance of the issue it has been much studied. There is an extraordinary number of studies examining the impact of smoke-free policies in the hospitality sector. These vary in quality, in funding and in conclusions. This paper examines the consensus view coming out of this work in an attempt to see what lessons can be learned about the likely impact in Ireland.

The issue for this study (as determined in the terms of reference) is the likely economic impact of the introduction of smoke-free workplace policies on the hospitality sector in Ireland. Strictly one should not ignore the impact of reducing premature mortality and morbidity among those engaged in the sector, to the extent that these happen, as a result of the ban or any associated benefits to non-smoking customers or the effect the ban might have on smokers themselves as these would be part of any wider economic impact analysis. However the question posed here is somewhat narrower, viz, the impact on hospitality sector business of the ban.

At its simplest, this may be reduced to a consideration of the extent to which any negative impact from a reduction in smokers' purchases are counterbalanced by an increase in non-smokers' purchases. The initial presumption (which is apparently widely believed by owner-interests in the hospitality sector) is that for smokers the ban will lead to a reduction in alcohol and food consumption in pubs and restaurants, as these are assumed to be, and have been shown elsewhere to be[1], complements to tobacco in consumption.

1 *See, for example, Decker, S.L. and A.E. Schwartz: Cigarettes and Alcohol: Substitutes or Complements, Washington DC, NBER Working Paper 7375, February, 2000; also, Dee, T.S., The Complementarity of Teen Smoking and Drinking, Journal of Health Economics, vol.18, no.6, pp.769-793, 1999.*

Hence for the hospitality sector, there is likely to be a reduction in sales from their existing customers who smoke.

This is the most obvious and immediate impact, and is one that drives the concerns of the sector with the policy change. Against this, it has to be noted that the majority of the population are non-smokers, and that for this section of the population smoking by others in pubs and restaurants reduces the benefits they could obtain from the hospitality sector, and must necessarily reduce demand. The smoking ban will, as a result, be presumed to increase demand from non-smokers who currently use pubs/restaurants for the services of the sector and from those who rarely use the hospitality sector. The net effect is what matters in determining the overall impact of the ban on the sector.

The most widely expressed concern in Ireland has been that derived from the expected impact on one part of the hospitality sector, namely pubs, although the hotel sector has also voiced concerns over sales through bars in hotels. While much of the empirical analysis in the later part of the paper looks at evidence from the hospitality sectors in other countries, the primary emphasis is on the applicability of the findings here, and in particular to the "licensed trade", predominantly pubs.

2. The Economics Issues Associated with Analysis of the Smoking Ban

2.1 INTRODUCTION: LIMITATIONS TO THE ANALYSIS

The stated purpose of the workplace ban is to eliminate one source of health risk arising from passive smoking, and to eliminate it because of its impact primarily on workers in establishments who may be seen as being exposed to this risk on an involuntary basis. In the case of the "hospitality sector", this seems to imply that it is not being introduced primarily to reduce the risk factor for most of those affected, since workers are a tiny proportion of the total population using these establishments even on a regular basis. However, the continuous exposure of hospitality workers to smoke during their working day cannot be ignored, as they are a particularly vulnerable group for that reason. The emphasis on the workforce, rather than customers presumably reflects the view that since customers voluntarily enter establishments where smoking is permitted they accept whatever health risk is involved as a form of implicit price in addition to the prices paid for consumption of goods or services while in the establishments concerned. Nor, it is stated, is it being introduced to reduce smoking amongst the rest of the population, although when seen against a steady tightening of restrictions on smoking it clearly fits into that strategy, and has been shown to have significant effects on smoking elsewhere amongst the population at large[2].

[2] *See, for example, Evans, W.N., M.C. Farrelly and E. Montgomery, Do Workplace Smoking Bans Reduce Smoking? American Economic Review, vol.89, no.4, pp.728-747, 1999. This study finds that smoking bans reduce both the prevalence of smoking (i.e., the numbers who smoke) and the level of tobacco consumption as measured by average daily consumption per smoker by as much as 5% and 10% respectively.*

There is also some evidence that as a complement to pricing policies, interventions such as workplace restrictions are particularly effective in reducing the incidence rather than the intensity of smoking[3].

This study does not address the issue of the scale of the health status risk for customers or workers. Nor does it address the question of the impact of the ban on smoking in hospitality sector establishments in terms of its impact on overall economic welfare. This is not simply a matter of being outside the scope of the study that was commissioned, but the ban itself avoids this issue by virtue of the fact that its objective is not overall economic welfare improvement, but improvement in the health status of a minority, namely workers in those establishments who are incurring the additional health status risk associated with exposure to passive smoking. That is to say, its basic objective has to be seen as redistributive to a greater degree than efficiency enhancing.

Opposition to the inclusion of pubs in the ban has been focused on three main issues. The first is the purely political question of freedom of association. This is clearly outside the scope of an economic study. The second concerns enforcement costs and feasibility. Enforcement costs are a legitimate matter for economic analysis, but were excluded from this study's terms of reference. The third is the impact of the ban on the money incomes of those working in the sector and owning the substantial investment in provision of the sectoral infrastructure – in the limiting case, bar staff and publicans. It is this question that we have been asked to examine.

Specifically, the OTC has asked us to review the evidence that is available from studies undertaken around the world in order to arrive at some conclusions as to whether or not the fears expressed by those opposed to the coverage of the ban are supported by experience in other countries in terms of the consequences of similar bans.

What has economic analysis to say a priori about the impact of a ban on smoking in pubs and restaurants on sectoral incomes?

2.2 THE DEMAND SIDE OF THE MARKET

The starting point here is to look at the demand side of the market, and then the supply side. On the demand side, it is convenient to segment the market into two groups. The first comprises those who do not smoke, and find that exposure to smoking reduces the utility derived from spending in these establishments. It appears that around 75% of patrons may be assigned to this category. For them, smoking by others constitutes an extra implicit price paid per unit of service consumed. They are the recipients of a negative external effect. The second is the group for whom the utility derived from spending in the establishments is enhanced by being able to smoke while doing so. The latter group, comprising 25% of patrons, are not seen as having their utility enhanced by passive smoking, (i.e., recipients of a positive externality) but as being a segment of the market for whom smoking is a complement to consumption of the other goods and services being supplied. Even this group are not indifferent to second-hand smoke, as survey work indicates that about one fifth of smokers avoid smoky premises.

In economics complements may be thought of loosely as being goods that are jointly consumed for the purpose of satisfying some particular need. A strict definition involves analysing consumption patterns in terms of "cross price effects"[4]. The argument advanced by those opposing the ban can be reduced to the proposition that smoking

[3] *See, Lanoie, P., and P. Leclair, Taxation or Regulation: Looking for a Good Anti-smoking Policy, Economic Letters, vol.58, no.1, pp.85-89, 1998.*

[4] *Goods are classified as being either "substitutes" or "complements" by determining empirically the sign of the effect of a change in the price of one on the level of consumption of the other, holding real income (utility) constant. Formally, for two goods, i and j, the test is the sign of the expression (*qi/*pj), where q refers to the quantity consumed of a good and p refers to its price. If (*qi/*pj) > 0 the goods are substitutes and if (*qi/*pj) < 0 they are complements.*

and drinking are not merely complements, but the degree of complementarity is such that the ban will result in a fall in total spending in these establishments, with obvious consequences for the levels of output, incomes and employment in the establishments. This in turn will have knock-on effects on Government tax revenues and spending, as taxes from the activity fall, while employees lose jobs.

In fact, these are two separate arguments. It is quite possible for the first to be true but the second to be false. That is, it could be the case that the ban would reduce the turnover of the affected establishments, but without necessarily reducing tax revenues; and could result in lower employment in the establishments affected without reducing employment overall.

If people spend less in pubs then either they save the difference or they spend it on something else. Unless it is assumed that the fall in spending in pubs is translated into increased savings, the impact on tax revenues will reflect the marginal effective tax rate on spending in bars compared with the marginal effective rate in some or all other sectors. The assumption is that the former is much higher because of the excise content in pub sales. However, it should be pointed out that the excise content in pub sales is about 40% at most, of the excise content in sales through off-licences, while the VAT rate is the same[5]. Furthermore, one has to ask whether less spending on drink in pubs might not mean more spending on petrol!

If the numbers employed in pubs falls as spending in pubs drops, but spending is shifted to other items, this will have a positive effect on employment outside the narrow pub sector. It is quite conceivable that the shift could increase rather than reduce employment overall.

The upshot of all this is that it is simply not at all obvious that if pub sales fall the knock-on consequences envisaged will actually be seen. However, what we have been asked to examine is whether or not the evidence supports the narrower proposition, namely that a ban on smoking in pubs (and restaurants) is likely to result in a fall in sales through those outlets, whatever the knock-on effects.

Staying with the demand side, and using the segmentation of the market already mentioned, this can be reduced to the impact of two demand shifts arising from the ban. In the first place, if the ban is effective in the sense that it succeeds in divorcing consumption of food and drink in licensed premises from smoking, it will shift the demand curves for those products to the left to the extent that smoking and consumption of the other commodities (and ancillary services) are complements. A priori we would not expect a uniform shift of the demand curve for all goods and services consumed. For example, anecdotally, it would appear that the complementarity between food and smoking is weaker (and less pervasive) than that between alcoholic drinks and smoking. Hence, to the extent that both are on sale in the premises affected, we would not expect to observe a similar impact in the case of the two commodity groups. The same might be true of non-alcoholic drinks. Survey work for Ireland indicates that there could be a reduction in drink, but an increase in food consumption, with an overall net increase in total expenditure.

To the extent that the complementarity effect is significant, the ban is expected to reduce the quantity of services demanded at any price, or, equivalently, the willingness of a consumer to pay (his reservation price) at any level of consumption. For service providers, as far as these customers are concerned the profit maximizing price for the product being consumed will unambiguously fall and incomes derived from the sale of services to this group will decline and the demand for labour

5 *Spirits and wine cost about three times in a pub what they cost in off-licences; beer costs over twice the off-licence price.*

inputs will shift to the left as well since the value marginal product of labour in producing the service will decline.

However, the ban will also shift the demand curve of the non-smoking group to the right, since it removes the implicit cost of purchasing services additional to the price actually paid. This will mean the opposite impact on incomes and employment in the case of non-smokers to that of smokers.

Hence, we have undoubtedly two offsetting demand side changes arising from the implementation of the ban. The net impact depends on the relative demand shifts in the case of each group, and their importance in terms of actual and potential use of the services by each of the two groups in the wider population. As a starting point it should be noted that since non-smokers (even in pubs) are said to out-number smokers by at least 3 to 1 (75% to 25%), taking pubs as a whole and on their own, the impact on sales etc., will be negative if, and only if, the left shift of the smokers' demand curve exceeds the right shift of the non-smokers by a similar proportion. That is, if smokers' reservation prices on average fall by 15%, revenues will decline only if non-smokers' reservation prices rise by less than about 11.25% (for a static population of non-smokers using the premises).

Reservation prices are not, however, uniformly distributed across the two groups. For want of any other working hypothesis let us assume that reservation prices are normally distributed in both groups for any given availability of the product. If this is the case and the ban reduces demand for drinking in pubs, some of this will come from a (probably very small) number of individuals for whom, at the nominal price of drink, their demand curves are so shifted that their chosen consumption level is zero. They simply drop out of the market. We would expect that the ban would have the counter-balancing effect of inducing non-smokers who (in the absence of a ban) would choose a zero level of consumption to enter the market. If the distributions are symmetrical the number of non-smokers entering would exceed the number of smokers exiting.

Unfortunately this cannot be interpreted as saying that for each drink not bought by the exiting smokers more than one drink will be bought by the entering non-smokers. In fact, cet. par., we would expect this not to be the case, since there is no complementarity effect in the non-smokers' decisions on alcohol consumption comparable to that affecting smokers. If we model alcohol consumption as decided by reference to price, income and availability, then non-smokers are merely replacing drinking elsewhere by drinking in pubs. Unless we assume that on average non-smoking entrants are heavier drinkers than exiting smokers (anecdotally implausible, and defying the complementarity effect, though it is likely that heavy smokers who are light drinkers are more likely to exit than light smokers who are heavy drinkers) the net effect per person moving of exit and entry alone is likely to be a reduction in drink sales in pubs. However, the entry effect has to be added to the impact on current non-smoker customers' decisions to derive the total right shift of the demand curve from non-smokers. The real question is how strong is entry and increased demand of current non-smoking customers likely to be relative to exit of current smoking customers. Our best guess is that exit will be low, although sales per smoker should decline, while entry will be larger in number, but predominantly among people with low demand for drinks at any price.

The point of the foregoing paragraphs is to indicate just how difficult it is on an ex ante basis to determine the net effect, whether positive or negative, or the size of the net demand side effect of sales through affected premises, of introducing a ban. The implication is that only by examining actual outcomes in comparable circumstances can we provide any form of reliable prediction as to the demand side effects in the aggregate. It emphasises the relatively low value of ex ante studies based on surveys of consumer responses that are inherently qualitative, even if they are

rigorously executed in terms of question design and sampling procedures. These can at best indicate the likely direction of demand shifts among the segments of the population affected, but without any serious ability to predict the quantitative outcome in any dependable fashion.

2.3 THE SUPPLY SIDE OF THE MARKET

So far the analysis has been on the demand side consequences of a ban on smoking. If we are trying to estimate the effects on sales revenues it is obvious that we should also consider the possibility that suppliers will respond to the ban in a way that affects revenues. It is already evident from newspaper reports that this is indeed taking place. The best known example of a supply side response is the reported decision of some larger pubs in the major urban areas to invest in extensions to their premises that will avoid the scope of the ban: "open" areas that are covered and heated but do not constitute an enclosed workplace.

This particular response is qualitatively the same from an economics perspective as the proposal that pubs and restaurants invest in superior ventilation systems. We do not propose to evaluate that proposal, but we note that it too constitutes an investment.

To summarise, we see that it is possible (although not at a trivial cost) for suppliers to respond to the new constraint on their operations by altering the "production technology" adopted (much as manufacturing industry can respond to environmental restrictions on emissions). There is a crucial difference between the latter and (especially) pubs, in that when environmental policy imposes emission controls it affects the marginal as well as fixed costs of operations. Higher marginal costs reduce output levels and (normally) sales revenues. In the case of this type of response by pubs the cost is predominantly a fixed cost. If pubs cannot pass on the expense (because they are already charging profit maximizing prices, so that higher prices would reduce the gross surplus), then the cost is borne entirely out of profits, and is, in effect, a tax on the value of the licence, but a tax that is not received by the Exchequer.

However, one interesting implication of this type of response is that it enables (even encourages) pubs to engage in price discrimination. Smokers have a lower price elasticity of demand for alcohol, cet. par., precisely because of the complementarity effect. By creating a device to segregate smokers it becomes feasible to charge different prices to smokers and non-smokers for drinks (and possibly food) supplied to them. A profit maximizing price discriminator will charge a higher price in the market segment with the lower price elasticity of demand. Thus, the ban permits the pub with local market power to invest in a device that permits profitable price discrimination.

Finally, on the supply side, we can consider the impact of the ban in terms of the product mix supplied by the pub. The pub "sells" not just drink, but a compound product, a "drink in a pub". The other elements in this product are: ambience, fittings, quality and quantity of bar service, ancillary services (e.g., TV screens, live music…) and other products for sale. We expect that the mix of components will reflect demand and supply side considerations. If a particular element rises in price, we expect to see its weight in the compound product reduced. One such element in the compound product mix is the ability to offer smoking as well as drinking facilities. A ban on smoking changes that mix. We expect to see pubs respond by increasing the quantity of some or all of the other elements as a consequence of the increase in implicit price introduced by the ban. These will offset at least in part the revenue losses resulting from the leftward shift in the demand curve of the smoking population by reducing that shift. Thus revenues can be affected by the response of suppliers to a ban.

2.4 CONCLUSIONS

The main conclusion that we wish to emphasise here is that to predict the outcome of a ban on smoking on sales and employment in a given sector on an ex ante basis is extremely difficult, since, while we can identify most of the relevant causative factors, we may (and do) have serious problems in terms of calibrating them, or even of ranking them in terms of their magnitudes. No matter how well they are done, attitudinal or expectations surveys simply cannot do the job effectively. Of course it matters that they are well done, as they provide the only evidence, albeit limited, of the effects of change. Economic model building in principle offers greater certainty of ranking and even of calibrating the various effects, but suffers from two gaps in our knowledge. The first is objective data on the market (e.g., the distribution of preferences referred to at 2.2 above) and the second is reliable econometric analysis that provides quantification of the major effects so as to predict them in the Irish context based on Irish data.

The implications of this are obvious. If we restrict ourselves to what we know about the Irish market in order to arrive at some conclusions as to the revenue effects of the ban we will simply be unable to come to any firm conclusions.

Hence, if we wish to see what is likely to happen here, the best approach is to examine what has happened elsewhere and make whatever amendments appear justified by knowledge of peculiarly Irish aspects of the market here. That is the rationale behind the next section of this study, which is based on an evaluation of empirical work outside the country with a view to establishing whatever reliable conclusions may be drawn from it as to likely consequences in this country.

3. Empirical Studies on the Impact of Restrictions in the Hospitality Sector

3.1 INTRODUCTION: A CAUTIONARY NOTE

In this section of the study we provide a survey of the main conclusions of the qualitative and quantitative research into the impact of smoking restrictions on the level of economic activity in the hospitality sector. As will be seen, by far the largest component in the research output comes from outside the economics profession, narrowly defined (although some researchers have clearly had some training in quantitative techniques). This is a serious weakness if the output of the research is to be treated as providing a reliable consensus view of the economic consequences of the proposed ban in the hospitality sector. This is not to say that the implication of the consensus view from this literature of what is likely to happen in Ireland is wrong. But it does mean that if it turns out to be right, it is right despite the fact that it is not based on what would be treated in the economics profession as a scientific analysis. The depth of this problem may be understood by reference to a very recent publication by two of the most prolific authors in the field[6]. Published in May 2003, with a smoking control provenance, it cited 32 sources, official, academic and advocacy, for its conclusions. Not one of these was a peer-reviewed economics research paper, and only one appears to have had substantial economist involvement in its production.

The data problems discussed in the last section have been a pervasive problem in the literature, so that little of the research is in any serious way based on developing and testing models formally grounded in optimizing behaviour by consumers or producers. As an alternative, studies have for the most part relied on two alternative basic approaches; one using subjective data while the other uses objective data.

6 *Glantz, S.A., and L.R.A. Smith, Economic Impact of Smokefree Air Laws and Policies, Americans for Nonsmokers' Rights, May, 2003*

The first approach is mainly ex ante, attempting to ascertain the likely impact of the reduction in sales if a ban is introduced, and is based on surveys of customers or producers. This type of work is notoriously unreliable in quantitative terms of predicting consumer behaviour from consumers' responses, because of the hypothetical nature of the survey, and from suppliers' responses, because of a desire for no change in existing arrangements where there is some uncertainty in relation to outcomes. As with all survey work, a further difficulty lies in the reliability of the sampling procedures used.

The second approach attempts to use objective ex post data on sales, employment, etc., before and after the regime change, generally using pooled time series and cross section data. A major difficulty with this approach is that generally the ban is not a "shock" (i.e., unexpected) to suppliers. It must be assumed that the imminent introduction of a smoking ban is likely to lead to a change in the product that the sector offers, and this may not be picked up in the studies. A further difficulty is that the results may be, to an important degree, a reflection of influences peculiar to the place and time being studied, and as a result may be of limited applicability "out of sample" (i.e., extrapolating from experience in one country to predict the outcome in another).

There is yet another matter that has to be confronted in evaluating the research that is in the public domain. That is publication bias. To explain this it is necessary to point out that perfect and definitive results are rare (if they exist at all). Research should be thought of as being a form of sampling itself. Researchers apply models and analyse data to try to derive conclusions about an underlying universe from a sample population of observed data. The data is not only a sample, but may be flawed; the models may be a close or distant representation of the underlying relationship. However, and especially in a contentious context such as this one, what is published may be a highly biased sample of the actual results obtained. This is because funded research is less likely to be published if its conclusions contradict the prior beliefs of the funding agency, or compromise its activities. This applies in both private and public sectors, but is widely believed (possibly quite wrongly) to be more of a problem when the funding is derived from corporate sources with interests involved than when it is derived from public agencies. Economists are not easily persuaded by the proposition that while corporate activities are driven by considerations of private gain, the activities of public sector agencies are driven solely by the disinterested pursuit of the public good.

3.2 THE AVAILABLE RESEARCH OUTPUT

3.2.1 The Scollo and Lal data bank and conclusions

The most comprehensive summary of existing studies on the sectoral economic impact of smoking restrictions is contained in Scollo and Lal (2002) for the VicHealth Centre for Tobacco Control, Melbourne, Australia. This paper contained a listing and a classification of all studies found by the authors up to December 2002, over 100 papers, attempting to predict or assess the economic impact of smoke-free policies in the hospitality sector. The information collected on each study covered: author and year published; date and location of policy implementation; nature of policy implemented; publisher name and type; funding source; outcome measure used; type of analysis; whether economic trends were controlled for; a description of the findings; and whether the study was peer reviewed. For Scollo and Lal, a well-designed study should be based on objective measures of outcomes, use data before and after the policy event, use appropriate statistical tests and control for changes in economic conditions,

the so-called Siegel criteria[7]. The conclusion that Scollo and Lal came to is that where studies were well designed no negative effect from the introduction of smoke-free policies were indicated, while those studies using objective data which did indicate some negative results were flawed methodologically, in that they did not meet the Siegel criteria.

Of course studies based on subjective data by their very nature could not meet the Siegel criteria, yet this type of work may provide the only evidence available to policymakers when deciding on a policy change. It is also possible to design ex post work based on subjective data, which can then be related to objective data. A further conclusion of their analysis was that other studies indicating a negative economic impact were based on outcomes predicted before the introduction of policies, or on subjective or impressionistic data. Not all studies were peer reviewed, though there were many more peer reviewed based on objective data showing no negative impact than those based on subjective data indicating a negative impact.

Scollo, Lal, Hyland and Glantz[8] also carried out a review of the quality of some 97 studies or most of those covered by Scollo and Lal. The conclusions were similar, and there is a detailed discussion of these conclusions that is worthwhile to consider. The objective was to compare the quality of evidence and conclusions in relation to the impact of smoking bans on the hospitality sector based on the design, analysis and interpretation of the studies, along with some other information on funding and publication. The methodology used was interesting: peer reviewed articles were obtained from a search of academic papers; unpublished articles were obtained from lists of such papers maintained by anti-smoking groups, the websites of tobacco companies, and a general web search. This produced 104 studies of which 97 were selected for analysis. These covered 31 state or provincial areas in eight countries. Exclusion was based on whether an explicit or implicit attempt was made to quantify the economic impact of smoking bans. Studies examined were thus quantitative in nature and included those with objective and subjective data. Of the 97, with some overlap in the studies, 34 dealt with drinking establishments, 90 with restaurants, two with recreational venues, one with hotels (via restaurants), while one was concerned with tourism. The classification of the results of studies was based on an analysis of three assessors working independently. They agreed on the conclusions in 96 of the 97 studies.

The results of this work deserve attention. First, 37 used objective outcome measures (sales, employment, etc.); 24 were peer reviewed; 21 met Siegel's criteria – all of which had objective data. Of the 60 using subjective outcome measures, 59 met none of the Siegel criteria; peer reviewed articles were five times more likely to have met all the Siegel criteria than non-peer reviewed studies; 31 of the studies were supported by the tobacco industry, but only one of these was published in a peer reviewed journal, none met all the Siegel criteria and 26 met none of them; the funding of six studies was unknown; 23 of the remaining 60 studies were peer reviewed. Second, none of the 21 studies that met Siegel's criteria reported a negative impact on the relevant sector, while four of them indicated a positive impact; a negative impact was reported in seven of the studies with objective outcome measures, but none of these met more than two of Siegel's four criteria; only one peer reviewed work reported a negative impact. This latter work was based on subjective data and funded by the tobacco industry. Third, where studies concluded a

[7] *M. Siegel is an American medical epidemiologist. The criteria cited by Scollo and Lal appear in a 1992 paper: Economic Impact of 100% smoke-free restaurant ordinances, in Smoking and restaurants: a guide for policy makers. Berkeley: UC/UCSF Preventative Medicine Residency Programme.*

[8] *Scollo, M., A. Lal, A. Hyland, and S. Glantz, Review of the quality of studies on the economic effects of smoke-free policies on the hospitality industry. Tobacco Control 2003;12:13_20.*

negative impact from smoking bans objective data were rarely used (seven); none met the Siegel criteria; all were funded by the tobacco industry and only one was peer reviewed, as indicated earlier.

The authors indicated that when considering the quality of studies, policy makers should consider the following:

- Was the study funded by a source clearly independent of the tobacco industry?
- Did the study objectively measure what actually happened, or was it based on subjective predictions or assessments?
- Was the study published in a peer reviewed journal?

The overall conclusion they came to was that of the 35 studies with a negative outcome, none was independent of the tobacco industry, and none both uses objective data and was published. All 21 of the well-designed studies indicated no negative impact. On this basis policymakers could proceed with smoke-free regulations secure in the knowledge that there would be no adverse business impact.

3.2.2 Commentary on the Scollo and Lal analysis

The Scollo et al. papers perform a very useful purpose in listing, classifying and analysing studies in relation to the impact of smoking bans on the hospitality sector. The listing is relatively up-to-date. The more complete listing in the first document does not alter the general conclusions. There have been some studies since December 2002 but they again do not lead to any change. The availability of this literature should help to reduce the uncertainty facing policymakers.

The situation may not be as clear-cut as the authors indicate however, and the results do not have the effect of reducing uncertainty to insignificant levels.

There must be some concern with an unqualified acceptance of the Siegel criteria, as studies based on subjective data cannot by definition satisfy all these criteria. This creates a bias against these results, which may be unwarranted. When smoke-free policies were introduced policymakers did not have objective data, and were obliged to use subjective data. A similar study undertaken for policymakers would be unlikely to have produced different results to that undertaken by the industry, irrespective of who carries out the study. Economists are happier with "objective" data based studies. The discipline is inherently suspicious of the information content of subjective survey data given the evidence of preference reversals and contradictory responses[9]. That does not mean that they are regarded as valueless.

The difficulty with this type of study remains the hypothetical nature of the questions and the notorious unreliability of the results of such surveys. The study by Foley (see section 5.5 below) for the Licensed Vintners' Association (LVA) and Vintners' Federation of Ireland (VFI) falls into this category. It is difficult to see how the results could have been much different, though perhaps a different question set could have been used. Where suppliers' expectations are considered, even though they may know their existing customer base and may correctly anticipate their reaction, they are unlikely to know the impact on those who are not their current customers. Hence, a population-based survey is more likely to provide interesting information than one that is solely based on existing customers. As indicated earlier, it is also possible to design

[9] *One of the present authors undertook such a survey in 1990, dealing with voter preferences for tax and spending levels and changes, using professional survey services. The results are in many ways consistent with developments during the 1990s, but also show clearly the degree to which this kind of problem can arise with survey data. See McDowell, M., Public Preferences for the Level and Structure of Government Expenditure and Taxation: Survey results and Analysis, Dublin, Foundation for Fiscal Studies, Research Paper no.3, 1991.*

an ex-post study which can provide information which can then be related to objective data.

This is the rationale behind many business surveys, where the information on recent performance is available far in advance of the objective data.

The Siegel criteria also lead to the virtual exclusion of results contained in non-peer reviewed publications. Non-publication in a peer reviewed journal cannot be taken as conclusive evidence of poor quality. It may simply reflect commercial and academic reality. It may also reflect the object of the research and the audience at whom the paper is aimed.

Many studies are undertaken by consultancy firms, not by academics. There are few, if any, rewards for non-academics from publishing in academic journals that are subject to peer review. Some consultancy studies are carried out by academics. Academics derive little academic reward for publication of consultancy work. But they are exposed to professional reputation costs if they stray significantly from the requirements that are imposed in an academic context. Hence, authorship of non-peer reviewed publications should be taken into account in evaluating the conclusions. The Scollo and Lal approach is, in our view, defective in this respect, in that it tends to treat non-peer reviewed work as homogeneously suspect, which is surely not the case.

There remains a residual concern that there may be some bias among the researchers, since they were associated with tobacco control activities, leading to overstatement of results favourable to their case and understatement of the alternative. This underlies the publication bias to which reference was made earlier. Much is made in these two papers, and indeed in others, of the relationship between funding from the tobacco industry and anti-ban papers, as if this in itself is an argument against the results. The reason (usually implied, but sometimes stated expressly) is that the tobacco industry would only allow studies that support their case to see the light of day[10]. There are well-documented concerns about the tobacco industry's approach to research and business. It could also be argued that those who fund anti-smoking research would only allow research favourable to the case to be published. We are not in a position to adjudicate on this issue, and think that work should be considered on its merits. Hence, the approach adopted is to consider some studies in detail.

Turning to the broad conclusions of the Scollo and Lal paper, our view is that while the paper may err in its dismissal of all subjective work as of little value, we are generally supportive of the view that it is to objective data studies that most attention should be paid. We will be offering some criticisms of that work in the next section, criticism that weakens some of its conclusions. Nevertheless, there is little reason to reject the main thrust of the work they cover, in the sense that evidence on a similar basis to the contrary is not available. That is, at its weakest, a negative result, namely that there is little statistical evidence from that data set to support the proposition that a smoking ban in Ireland would significantly reduce sales on a sustained basis in the broadly defined hospitality sector, although it might redistribute sales between different types of outlet. That does not, of course, rule out a temporary downwards impact on sales, for which there is evidence from more than one study.

[10] *This perception is supported by the fact that several papers cited in Scollo and Lal's survey were at the time to be found on the website of one of the major tobacco companies in the US. They have subsequently been withdrawn, so that the present authors could not evaluate them. However, if the Scollo and Lal conclusions are to be accepted, these studies appear to have suggested that a negative sectoral impact was likely. Why such papers should be withdrawn by a tobacco company is unclear.*

4. Detailed Analysis of a Group of Studies

4.1 INTRODUCTION

The Scollo and Lal survey lists well over 100 papers or other sources of commentary on the effects of bans on economic conditions in affected sectors. Some of these they dismiss as being unreliable in the extreme, in the sense that they do not base their conclusions on what would be accepted as proper statistical analysis. From a technical perspective it is hard to disagree with their judgements in most of these cases. Policy decisions will, in general, be expected to improve when evidence- (rather than opinion) based. Evidence must be able to withstand critical, even forensic, criticism. Journalistic commentary, in general, fails this test in that it is, of its nature, usually a synoptic and second-hand reportage of others' conclusions without critical analysis.

Scollo and Lal reach a general conclusion that bans do not negatively affect the economic interests of affected sectors based on the general thrust of studies that use standard statistical inference techniques, and, in so far as possible, use objective and ex post data. To evaluate the conclusions reached we believe it is necessary to examine carefully some representative studies on which they rely. We have selected three. The selection is based on the apparent sophistication of the data used, the analysis applied to the data sets, and the frequency of citation.

4.2 THE BARTOSCH AND POPE STUDY[11]

This study examines the effects of smoking restrictions introduced by a group of communities in Massachusetts on the revenues of affected outlets in the hospitality sector. It is a very detailed study using regression techniques designed to detect and quantify any adverse effects on sales associated with the introduction of smoke-free policies. The study's data set is monthly observations on sales at the town level, during the period January 1992 – December 1995, covering 235 cities and towns. Of these, 32 introduced smoking bans over the period, while the remainder did not, though many had some restriction, such as non-smoking areas.

The study compared data before and after the introduction of smoke-free restaurant policies in both sets of towns and cities. This covered bars selling meals as well as standard restaurants. The object was to establish whether sales from all the affected outlets in a community, when aggregated, demonstrated any statistically significant impact of the introduction of smoking restrictions. Of its nature, it could not isolate outlet type specific effects, since it aggregated across outlets.

One problem was that the definition of smoke-free was not technically and legally consistent across all communities. For the purposes of the study, the restriction was interpreted as prohibiting all smoking in restaurants, and in the bar sections of these restaurants, unless confined to enclosed and ventilated rooms, though not to bars where food was incidental to drinking. The state has a 5% tax on meals so it was possible to identify taxable meal receipts separately. A considerable effort went into cleaning up the data and ensuring the data was reasonably good. The data consisted of 48 months of pooled inflation adjusted restaurant sales data for each of the 235 towns and cities.

Fixed effects (removing all town and city specific factors) regression analysis was performed on the data, with the dependent variable being inflation adjusted taxable meals receipts or the ratio of meals to overall retail sales. The specification reported was a semi-log specification (except for the ratio variable, where the ratio itself was used), that is, the dependent variable was the logarithm of meals receipts, while the right hand side, independent or (presumed) determinant variables were not in logarithmic form. No explanation is offered for this specification.

[11] *Bartosch, W., and G.C. Pope, The Economic Effect of Smoke-Free Restaurant Policies in Massachusetts, Journal of Public Health Management Practice, vol.5, no.1, pp.53-62, 1999.*

The independent variables included a term to capture the effect of smoke-free policies, taking a value of one for all months for all towns where smoke-free policies were in operation, and zero otherwise (called ADOPT). This type of variable is known as a dummy variable, and is widely used where there is a regime change. This is the critical variable, and essentially the study seeks to determine if the coefficient on this term is zero (statistically no different to zero), in which case it can be concluded that smoking bans had no impact on sales, assuming other characteristics of the model are correct. An allowance was made for seasonal factors, a time trend was included to account for secular changes, population and per capita income were also included, (except in the case of the ratio of meals to retail sales). An allowance was also made for whether smoking bans prohibited smoking in free-standing bars, whether there were variance provisions, and finally an allowance which finessed the non-ban communities into those that had other restaurant smoking policies and the remainder.

Four models were estimated. The first looked at taxable meals receipts and had ADOPT, seasonal factors, county per capita income, county population, a time trend, and other non-smoking/ban smoking policies. In this model neither of the smoking variables were statistically significant, suggesting that the ban and restrictions on smoking had no impact on the dollar value of sales. The second model includes the presence of variance provisions, and whether smoke-free policies extended to free-standing bars. The paper states that these were entered as interaction terms with ADOPT, but the results do not contain coefficients for the interactive terms, and the model specification lists them separately along with their statistical significance. It is not clear whether in fact the model used did estimate interactive effects. If it did, it is not clear why the dummies concerned were included separately and their coefficients reported. None of these smoking variables were statistically significant, again implying that smoking restrictions had no impact on sales, even when relaxations in restrictions were applied or when extended to bars. The third model looked at expenditure on taxable meals receipts restricted to outlets selling alcohol with the same independent variables as the second model, but fewer observations. Once again, none of these smoking variables were statistically significant. Finally, the ratio of spending on taxable meals to retail sales was considered. This is an alternative approach to controlling for economic conditions, and the other variables were as in the second model. The smoking variables were not statistically significant.

The conclusion that the authors draw from this study is that the smoking restrictions had little or no effect on restaurant sales. In each of the models the coefficient on the ADOPT variable was positive, rather than the expected negative if bans had a negative impact on sales, but was not statistically significant. The other three variables were sometimes positive and sometimes negative, but none were significantly different to zero.

The critical data constraints of the study relate to the fact that it is based on aggregate town/city data, and not on establishment data. The authors recognise this and accept that there could be individual restaurants or classes of restaurants that were badly affected, but that this effect was lost in town/city level data. The study was also not a randomised controlled experiment, and it is conceivable that the towns/cities where the smoking bans were introduced were those where restaurants were unlikely to be affected. Nor did the study include data on enforcement. The use of cross-section data on incomes plus a time trend is a very poor and unreliable proxy for income variation over time, since it first assumes that relative incomes by area remain constant, and secondly assumes that the time trend is dominated by income changes. Finally, no data were included on how establishments reacted to the introduction of the smoking ban. If a smoking ban were imminent, and restaurants believed that the ban would adversely affect business it is unlikely that they would do nothing in terms of the product offered.

While the study is useful in that it represents a serious attempt to apply statistical analysis to resolving an issue, these aspects of the procedures adopted weaken its credibility in terms of the data and measurement. In terms of the conclusions it reaches, to an economist the provision of diagnostics is very limited, and does not inspire confidence in the conclusions drawn. Ideally, we would like to have the data set to re-run the model and perform our own diagnostics.

At a more fundamental level the specification of the model is also a matter for concern. First of all, note that the dependent variable is, in effect, the level of spending in the establishments in a town. This means that what is being estimated is an expenditure function, not a demand function. A demand function would attempt to identify the effect of the ban on the volume of activity in terms of purchase as a function of price. An expenditure function measures the level of spending. Spending is identically the product of the number of units sold multiplied by the weighted average of unit prices. It follows that if unit prices rose or fell expenditure could be unaffected. If, for example, establishments lowered the explicit or implicit price per unit sold to counteract the impact of the ban total spending could well be unaffected by the ban. This, however, could hardly be described as the ban having a zero effect on business activity. Falling profits in such a case would not be picked up by the expenditure function approach.

Secondly, for an expenditure function approach to make sense and permit the drawing of sensible and robust economic conclusions, it is necessary that the model and estimation procedures used conform to certain basic fundamental economics constraints. These may be summarised in terms of the Deaton and Muellbauer "Almost Ideal Demand System" (AIDS) model. This requires the estimation of expenditure functions as a system, not as a single dependent variable regression procedure. The dependent variables are expenditure shares in total spending, not the level of spending on a particular item or its logarithm.

However, what we find most worrying in terms of the applicability of this result to Ireland is the fact that it looks at expenditure on restaurant meals, which may or may not include alcohol sales, and does not look at sales of alcohol on its own. There are substantial smoking restrictions already in place in restaurants. The full ban is an incremental change for restaurants. It is far more serious for pubs which up to now have not been covered.

The authors have subsequently updated this work with data to December 1998, not yet published. This update confirms the results of the original paper, with 70 localities having smoking restrictions.

These criticisms imply that were Scollo and Lal to apply the Siegel criteria properly it is hard to see how the Bartosch and Pope paper could be afforded much credibility. The point is that "peer review" can be relied on, if and only if, the peers doing the reviewing are professionally trained in a manner that will produce proper review. In common with most of the papers cited by Scollo and Lal, this paper was published in a journal that is by no stretch of the imagination an economics journal. To judge from the flaws that the present authors have listed, it does not appear to have been subjected to peer review by professional economists with a deep knowledge of econometrics and the estimation of demand and expenditure functions.

4.3 THE CCG CONSULTING GROUP STUDY[12]

The objective of the study was to examine the business impact of a ban on smoking. Because the study was undertaken before a ban it did not have a before and after comparison. Instead the study relied on surveys of people's actual pre-ban and expected post-ban behaviour.

[12] *CCG, The Food Services and Hospitality Sector and a Metro Toronto Smoking Ban, report prepared for the Hotel and Restaurant Employees Union, the Ontario Hotel and Motel Association and the Ontario Restaurant Association, 1996.*

The methodology was very straightforward. A considerable effort went into establishing the objective position that prevailed at the time of the study, distinguishing between smokers and non-smokers and by type of hospitality establishment based on survey data. The data from surveys were aggregated to determine overall hospitality expenditure, and these were found to be consistent with data on receipts of the sector, determined independently. Thus the pre-ban position was reasonably accurate.

The post-ban position was estimated from surveys of intentions (where the researchers scaled back intentions in order not to overstate the case), and these were aggregated up to produce sectoral and overall totals, using unchanged prices. The following table, adapted from this study is interesting.

Smokers v Non-smokers Annual Visits and Spending

	Smokers	Non-smokers	Total
Population	600,000	1,400,000	2,000,000
Pre-ban Visits (000)	130,500	202,500	333,000
Pre-Ban Spending $(000)	1,113,337	1,544,410	2,657,747
Expenditure per Visit Pre-Ban $	8.53	7.63	7.98
Post-Ban Visits (000)	95,200	216,125	311,325
Post-Ban Spending $(000)	707,687	1,670,803	2,378,490
Expenditure per Visit Post-Ban $	7.43	7.73	7.64

Although smokers were only 30% of the population aged 15 years and over they accounted for 42% of the pre-ban expenditure on the hospitality sector, and 39% of visits. Hence their average expenditure per visit was greater than non-smokers. However this greater expenditure per head is partly explained by a different mix of type of establishment, with smokers frequenting more high value hospitality outlets. Post-ban, smokers indicated that they would reduce their visits, and this reduction would not be uniform across all types of establishment. Hence the decline in expenditure is greater than the decline in numbers, as the smokers' shift from high value establishments is greater than from low value establishments. At the same time non-smokers indicated through surveys that they would increase their visits, and overall expenditure. The net effect is a reduction in overall expenditure however, as the increase in visits and expenditure by non-smokers is insufficient to outweigh the decline by smokers. There is a revenue loss to the sector of 10.5%.

The value added by this study is the classification by type of business. Twelve categories are reported with five of these accounting for 55% of total expenditure. These five, with the expected % decline in revenue in brackets are Fine Dining (-10.6%), Night Club (-19.4%), Bar/Lounge (-14.1%), Bar with meals (-23.2%) and Casual Restaurant (-7.4%). Together these account for 77% of the decline in revenue expected following a ban on smoking in this sector. If a ban has any impact, or even if it has no impact overall, it is unlikely to be neutral between sub-sectors, and this is an important result. However, the overall conclusion is heavily conditioned by the basic data, which is survey based. Ex-post surveys are unreliable indicators of future behaviour, even if they constitute the only evidence available.

This study also provided an estimate of the local economy-wide impact of a smoking ban by considering the direct and indirect effects of the reduction in expenditure on the sector and its purchases of goods and services from other sectors. However, this analysis makes no allowance for increased expenditure on other sectors of the income not spent on the hospitality sector. The results would be valid if the reduction in expenditure were saved. This may not be realistic.

4.4 THE HYLAND, PULI, CUMMINGS AND SCIANDRA STUDY[13]

This study set out to examine the impact of smoke-free regulations in five counties of New York State that had implemented such regulations since 1995 in relation to hotels and restaurants. These five counties covered almost two-thirds of the state's population. The dependent variables for this study were restaurants' taxable sales and employment levels, formulated in five different ways: per capita taxable sales from eating and drinking establishments; the fraction of retail sales from eating and drinking establishments; per capita taxable sales from hotels; per capita restaurant employment; and, per capita hotel employment. Data from all counties in New York State were included in the analysis.

In using these data the study is an improvement on Bartosch and Pope in two respects. In the first place, by including employment they are examining the impact on an input into the output, so that unless the product mix changes after a ban (which is quite possible, even probable) any change in employment levels may be taken as a priori evidence of a change in the volume of sales (i.e., it is not an expenditure function model, and subject to the problems already identified in respect of such models). The second is that, albeit in a crude fashion, it does attempt to distinguish between types of establishment in a more acceptable manner than in the case of Bartosch and Pope.

The model used was relatively simple as the independent variables were: presence or absence of smoke-free regulations, time, season, and unemployment rate. The five independent variables were analysed by looking at the position one year before and one year after the smoke-free regulations came into force. The statistical analysis was somewhat unusual in that tests of significance were not presented, instead 95% confidence intervals for the coefficients were provided and there was textual discussion. Statistically significant increases in eating and drinking taxable sales and in hotel taxable sales were associated with the presence of smoke-free regulations. No association was observed between employment levels and smoke-free regulations.

This is an interesting, but puzzling result. If the volume of sales in hotels rises but employment does not, then sales per employee must rise, an increase in physical labour productivity. That begs the question as to why, prior to the ban, employment overall levels in the sector in affected areas were not lower. If, on the other hand, the volume of sales does not change, but the average price rises (an increase in sales reflecting higher prices rather than a volume increase) the value marginal product of labour has risen, and we expect to see higher employment. Logically this implies that some of the increase in sales observed must represent an increase in the unit price of sales as a consequence of the ban (or at least contemporaneous with the ban). That in turn means that establishments were able to increase prices profitably, implying a net outward shift in the demand function for the relevant products in hotel enterprises as a whole.

The coefficient on restaurant employment was negative, but not statistically significant. Interpreting this at face value suggests that whatever the effect of the ban was, it was not uniform across sub-sectors of the hospitality sector.

County-specific analysis was also carried out. Per capita taxable sales in eating and drinking establishments increased in three of the five counties, with one being statistically significant. Hotel sales increased in all five counties, with two statistically significant. There was no relationship between the introduction of a smoking ban and the

[13] *Hyland, A., V. Puli, M. Cummings and R. Sciandra, New York's Smoke-free Regulations: Effects on Employment and Sales in the Hospitality Industry, Mid-Hudson Information Center, 2003.*

ratio of taxable sales in hotels and restaurants to overall retail sales. Per capita employment in restaurants increased in three counties, but declined in two. A similar picture emerged with regard to hotels, but the mix was not identical. There were statistically significant increases in per capita restaurant employment in New York City, and decreases in two other counties. There was a statistically significant increase in per capita hotel employment in three counties, a decrease in one.

The overall conclusions of this study were that smoking bans were not associated with adverse economic outcomes in aggregate. County-specific analysis reached a similar conclusion in general, though there was variation between counties. Out of 25 county tests seven were associated with increased activity, 15 had no association, while only three indicated reduced activity.

This study is interesting in that it is very recent, and confirms the results of much earlier work. It is also interesting in that a certain amount of irritation is evident at the need for another such study. The authors note conclusions from the results and quality of studies as indicated by Scollo et al., and remark that "results from other localities are discounted as not being relevant". Policymakers also are unwilling to implement smoke-free policies because of the supposed effect on business, despite the evidence that such policies do not harm business. As the authors state:

> *"The data presented in this paper – together with the wealth of published data on this topic – show that, despite the dire predictions of revenue and job losses, the hospitality industry does not suffer adverse economic consequences after smoke-free regulations are implemented. Evaluations have been conducted in different type of communities; different types of business have been evaluated; and different outcomes have been studied. Throughout these studies the data show that smoke-free regulations are not bad for business."*

The paper concludes with a plea to just get on with it and protect the health of employees and patrons from second-hand smoke.

This paper is not as clear as the two other papers discussed above. It is not obvious from the text what the approach was. The reporting of the results could be improved, with the addition of t-statistics. Nor is the county-specific analysis clear, as there must have been a very small number of observations for each county. It is not obvious what the rationale for a time trend on monthly data is over such a short period, and there may be too much left out. The seasonal pattern is very strong, and there must be a suspicion that much of the work in the regression is being done by this. It is impossible to evaluate the county-specific model on the information given. Again it would be useful to have the basic data of these studies.

5. Other Studies

5.1 INTRODUCTION

In the Scollo and Lal survey a long list of studies is cited. In the last section we looked at a group of studies that included the most frequently cited work it reviews. Other work, in some cases cited in the survey, in some cases not, are, we believe, worthy of being examined in order to get a fuller picture of the general position. While our brief was to look at work outside Ireland in order to derive conclusions as to the applicability of their results in Ireland, we believed that we should also refer to recent work that has been produced as a contribution to the debate in this country, again limited to the economic implications of the ban on smoking in the workplace on the hospitality sector.

5.2 THE CORNELL STUDY[14]

This paper has been widely cited as indicating that experience in New York City of the introduction of a smoking ban in restaurants in 1996 indicates that a ban is likely to increase sales revenues rather than reduce them in affected premises. In its presentation, in economics terms, it implies that this is a consequence of the rightward shift in the demand function by non-smokers, and that this has a greater impact than any leftward shift of the smokers' function in terms of impact on demand.

The New York City's Smoke-Free Air Act, a law that banned smoking in almost all restaurants in the city, went into effect in April 1995. The study examined how dining habits and spending patterns had changed four months after the Act's coming into force. Its conclusion was that predictions of fewer sales to smokers were correct, but that these were more than offset by increased sales to non-smokers. The implication of this finding, especially when linked to the greater number of non-smokers than smokers in the population, is that restaurant owners stand to benefit financially from implementing non-smoking policies.

The study was critical of a study by a tobacco related group on sales in restaurants one month after the Act came into force that showed a substantial decline in sales. This criticism was based on a view that the latter study had attributed a fall-off in sales to the ban when other contemporaneous factors, independent of the ban, were not being taken into account.

5.3 CRITICISM OF THE CORNELL STUDY

The most trenchant criticism of the Cornell study was that released by Michael Evans of the Evans Group economic consultancy firm, based in Evanston, Illinois[15]. This is one of the papers that is excluded from serious consideration by the application of the Siegel criteria in the Scollo and Lal paper. It is reasonable to assume that this paper was the product of a consultancy contract (the paper does not give the provenance). However, it should also be noted that Michael Evans is a professional economist with a strong academic research reputation, which is at stake when producing a consultancy report. In our view, the observations made about excluding consultancy research from consideration of the likely impact of a ban are strongly supported by the Evans criticism of the Cornell study. Evans argues (and is correct in saying) that even if spending levels are used as the key magnitude to be measured, the Cornell study does not in fact permit conclusions as to spending levels before and after the ban. There are internal contradictions in the arithmetic of the data presented. Its conclusions are based on population values that are not those found in the sample. The magnitudes they report for expected values for average sales depend (or can be said to depend) in effect on limited enforcement.

[14] *Corsun, D. et al., "Should NYC's Restaurateurs Lighten Up?" Cornell Hotel and Restaurant Administration Quarterly, April 1996.*

[15] *Evans, M.K., Review of "Should NYC's Restaurateurs Lighten Up?", Evans Group, Evanston, Ill., 1997.*

There was also an unexpected result that is not explained whereby it appeared from the responses obtained from the sample (less than 400, it should be noted) that 6% of non-smokers said that as a result of the ban in restaurants they were more likely to repair to bars that were then still exempt from the smoking ban. We have seen no attempt in the literature to deal with these criticisms, other than the response to the effect that the conclusions in the paper concerned can be discounted as being the output of a consultancy contract (as are those in this paper).

5.4 THE DUNHAM AND MARLOW SURVEY AND STUDY[16]

This constitutes one of the few contributions to the debate from professional academic economists[17]. It is an analysis of survey data based on responses to questions as to likely outcomes, and is subject to the inherent problems of such studies. It is, however, worth taking seriously not so much for the quantitative implications of its findings but for the qualitative results it offers and as a template for the analysis of survey data in this context. The survey is based on a random sample of 1,300 restaurant and bar owners (note: this study excludes hotels) across the US. It is an ex ante survey in which the respondents are asked to give predictions as to the impact of a smoking ban on business.

The Dunham and Marlow study agrees with most of the criticisms we have already advanced as to the reliability of the analytical exercises that have been widely reported, and add some more on serious problems of sample bias and control procedures:

> *"Previous studies offer little information about the economic effects of bans on restaurants and bars. Sample selection bias and a statistical methodology based on community averages and control group comparisons do not clearly isolate economic effects. No information on how such effects differ between establishments is reported. Many non-ban factors that affect revenues are not properly controlled for, leading to serious questions about whether such studies tell us much about the effects of smoking laws on firms. Imperfect enforcement procedures and sample selection problems suggest problems with predictions of how laws would affect other cities. Finally, studies focus on revenues, whereas profits are the more useful indicator of economic effects on firms." (p.328)*

The direct responses as to the probable impact of a virtual ban on smoking differed significantly across the two sectors. Allowing for a 4% margin of error the responses indicate the following:

> *Restaurant owners expected less business disruption in the form of a fall in sales than bar owners by a factor of two to one (40%+/- to 80% +/-).*
>
> *More restaurant owners expected sales to be unchanged than expected a fall (50% +/- to 40% +/-).*

Experience of existing smoking restrictions was associated with increased pessimism among bar owners: where no restrictions were in force, bar owners reported a lower expectation of a fall in sales from a ban.

The first interesting point here is the fact that the expected impact differs to a substantial degree by class of establishment. If expectations are in any way rational, that implies that aggregating over different types of establishment in ex post studies is virtually certain to bias downwards the reported impact of a ban as applied to bars.

16 *Dunham, J., and M.L. Marlow: Smoking Laws and their Effects on Restaurants, Bars and Taverns, Contemporary Economic Policy, vol.18, no.3, pp.326-333, 2000.*

17 *The survey refers to most of the well-known studies in the area. Apart from one paper by the same authors on a similar topic (dealing with seating allocation responses to smoking restrictions) there is not a single paper by a professional economist in a peer-reviewed academic economics publication listed, confirming our earlier observation as to the weak provenance of the statistical conclusions that have formed the basis for the current consensus.*

The second is the impact of experience with existing restrictions. Amongst restaurant owners the expected effect of a ban is unaffected by whether or not the respondent operates subject to existing restrictions, or without restrictions. However, among bar owners the experience of existing restrictions is statistically associated with more pessimistic expectations as to the consequences of a ban.

A logit analysis indicates that the responses accord reasonably well with what would be expected in terms of economic rationality. For example, restaurants' existing allocation of space to non-smoking was negatively related to the probability of reporting an expected fall in revenues. Restaurants that were longer in business were more likely to expect a decline in sales (whether this reflects experience of the business or a steady customer base is not clear). Larger restaurants expected lower revenues after a ban more than smaller ones. None of these (other than a weak non-smoking space effect) had any impact on bar owners' responses.

5.5 THE GOODBODY STUDY[18]

This study, which was commissioned by the Irish Hospitality Industry Alliance (IHIA), which is opposed to the workplace smoking ban, argues that the underlying case for restrictions of the type being introduced is not conclusive, both in terms of health consequences of passive smoking and the possibility of alternative methods of arriving at the desired objective. These issues are outside the terms of reference for this paper. We consider only the section of the Goodbody study that attempts to calibrate the economic consequences of a ban on smoking in the hospitality sector.

The study's starting point in relation to the economic implications of a ban is the conclusion it draws from its information as to the impact on the hospitality sector in North America (Section 9.2, p.23)

> "*The evidence in the US and Canada is uniform and categorical. A total smoking ban will result in a fall in sales and, consequently, redundancies will inevitably arise. How the situation may play out in Ireland is, however, a matter of some conjecture.*"

Unfortunately, the study does not list much by way of print material research that would support this position in its list of sources on which it relies. The Evans study discussed above and a couple of consultancy reports prepared (it seems) in support of those opposing the introduction of a ban are the only substantial pieces of evidence. The remainder is, as far as we can judge, ephemeral journalistic commentary. A search of about a third of the cited websites (excluding ASH and similar sites) did not turn up supporting evidence either.

The Goodbody study provides a scenario approach based on hypothesised falls in sales in the hospitality sector. Leaving aside the question as to whether the falls considered are in any degree probable, rather than merely possible, we have serious reservations about the methodology used to produce the employment and Exchequer consequences of projected contractions in sales.

In the first place, as far as we can judge, it appears that any reduction in sales of excisable products through pubs, etc., is not offset by a rise in sales through off-licence premises. In the second place, the VAT loss associated with any fall in sales is not net of any increase in VAT from increased spending in other sectors. Thirdly, in calculating the employment effect it is expressly assumed that the sales elasticity of labour demand is unity, which, while possible, is far from being demonstrated as a fact as far as the sector is concerned, and, even if true at existing output and employment levels, is unlikely to hold true for changes in sales levels of anything from 5% to 30%. The employment reduction, even if actually experienced in the sector, must be an over-estimate of the total employment effect since

[18] *Regulatory Impact Assessment on Draft Ministerial Regulations to Ban Smoking in the Workplace, Including Hospitality Venues, A&L Goodbody Consultants, August 2003.*

if spending is displaced from bars and hotels it must increase the demand for labour elsewhere. These, of course, are merely reiterations of some of the points made in section 2 above.

5.6 THE FOLEY STUDY

This study[19] was released in July, 2003. It was commissioned by the LVA and the VFI, both representative groups of publicans that are publicly opposed to introducing the ban. It is an ex ante study, based on responses obtained for the study's sponsors by a market research firm, Behaviour and Attitudes. The paper does not include any details for the survey in terms of the sample size or the questionnaire. Its scope is limited to pub sales.

In several respects, its findings mirror those found in the US in surveys of current practices and intentions. For example, smokers frequent pubs to a greater extent than non-smokers, given their shares in the population. The reported intention by smokers to use pubs less (whatever that means) exceeds that of non-smokers to use pubs more (but by a margin that would not normally be considered to be statistically significant in a typical 1,000 person sample, although this is not mentioned by the author). Spending per smoker is reported as exceeding spending per non-smoker (in the text; details are not given).

The methodology requires the author to offer estimates of the impact based on arbitrary values for changes in the use of pubs reported as "a lot less" or "a little less" and so on, and weighting them by proportions in the customer base and the difference in spending (he attributes a 20% excess to non-smokers – conservative if the survey really does support a 33% difference). His conclusion (p.15) is:

> *"Based on the assumptions and on the survey and other data a decline in the range of 4% to 8% in sales volume seems reasonable."*

Foley then goes on to extrapolate the likely decline in volume into employment consequences and Exchequer consequences, once again based on a series of assumptions as to what seem to him to be reasonable reaction coefficients, but are in effect linear extrapolations.

The conclusions of the Foley paper are very tentative, being dependent on a large set of assumptions all or any of which could turn out to be unsustainable, which is, in effect, accepted by the author. In terms of the likely impact, they may be summarised as negative conclusions. For example, he argues that to rely on non-smokers using pubs more to offset smokers not using them may be unwise, given that most non-smokers (especially among the young) are already habitual pub users. In other words, there can be relatively few "new" users. In this view the number of new entrants is limited, but no allowance is made for greater consumption by existing customers. However, when the basis for his 4%-8% likely outcome is made explicit, it is clear that the author regards any such outcome as more in the category of "possible" than "probable". We would be happy to accept his finding (p.25) that

> *"Unlike the findings of many international studies it is not possible, on the basis of the survey, to conclude that there will not be a negative impact."*

While

> *"Actual behaviour may deviate from the predicted behaviour in either direction, indicating the high degree of uncertainty in assessing impact."*

[19] *Foley, A., The Possible Economic Impact of the Proposed Ban on Smoking on the Licensed Premises Sector, Dublin City University Business School, July, 2003.*

6. Implications for Ireland

The set of studies listed and analysed by Scollo et al. provide a general conclusion about the hospitality sector viz. that the introduction of a smoking ban will not have a negative impact conclusion on the hospitality sector. The more detailed discussion of the selected papers would not lead to any change in this general conclusion, but there is a residual concern with the testing of the models. The studies are generally not specific to pubs, though these are included in the sector or part of restaurants plus free-standing bars. This finding can provide no comfort to any individual outlet, since these vary by location, product mix and profile of customer.

The consensus from the empirical work that has been published, most based on the US, is clear: smoking bans have no discernible effect on sales through hospitality outlets in the aggregate. However, when these studies are examined in more detail from an economist's perspective, it rapidly becomes clear that the studies are seriously deficient, and there is no sound economics basis for much of the widely cited conclusions. On the other hand, reports of declines in sales in the sector are equally unsupported by academically respectable evidence. The most that can be said on this basis is that the case for or against a decline in sales remains open.

The principal difficulty for an economist with the "serious" studies of the effects of bans is the ad hoc nature of the equations estimated in order to evaluate the impact of the bans. A secondary question concerns the conclusions drawn from the statistical evidence reported, since invariably the level of diagnostic information provided is far below what would be demanded in professional economics journals. We cannot say whether they meet the requirements of medical statistical analysis. Nevertheless, the weight of studies, flawed though they are, is clearly on one side. Further, they use different data sets, different locations and different ban episodes, but are more or less in agreement on the impact of the ban on their chosen set of dependent variables (which again differ as between papers). This makes it difficult to dismiss out of hand the general conclusions reached simply on the basis that the individual papers were flawed, since the flaws were far from uniform across all papers.

This does not permit the conclusion that the general weight of evidence from the hospitality sector outside Ireland can be simplistically applied in Ireland in order to predict the outcome of the smoking ban. We are not here relying on demand side factors (different tastes, etc. and/or different income levels) but on the supply side structure of the sector here. For example, this structure is much more heavily regulated in Ireland than in the US, and the numbers of outlets is subject to numerical control. The outlets differ in size in many respects, reflecting the regulatory environment. The product mix also differs between Ireland and the US. In addition, without exception, the US based studies that find no effect are based on complete or incomplete aggregation across the sector in terms of the product mix of outlets. This means that aggregation bias is unavoidable. The values obtained from such exercises cannot be taken as uniformly applying in sub-sectors. In particular this means that stable demand overall in the hospitality sector before and after a ban may mask a decline in one segment offset by an increase in another[20].

Turning to Ireland, and in particular to the impact on narrowly defined licensed premises (i.e., those

[20] *In this connection, it is worth reporting that ad hoc, journalistic reportage from California indicates a fall in the number of "bars" in the year after the introduction of the ban. We do not necessarily argue that this was due to the ban, since other factors (such as economic conditions) could be responsible for this result. The proposition remains to be tested.*

with pub licences), as opposed to other outlets selling alcohol for consumption on the premises (hotels and restaurants), one aspect of the studies examined that has to be taken into account is the evidence that perceptions as to the impact of a ban vary systematically across outlets. It is of course possible that there is an unequal differential ability to predict the consequences of a ban. That is to say, bar owners expect worse effects because they have poorer information or a weaker ability to derive accurate forecasts from it. We have seen no evidence to suggest that this is the case, but, given the restriction on entry, it is possible that relevant information as to latent demand is not as easily available as in other segments of the market.

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