Patrick Grady
May 22, 2003

Comments of "Economic Impact of Municipal Smoking By-Laws on Restaurants, Bars and Taverns" prepared by Economic Services, The Conference Board of Canada

The Conference Board has applied a relatively standard approach to estimating the impact of the anti-smoking by-law using a permanent income model of consumer behaviour. It should be emphasized, as the Conference Board correctly does in the study's Executive Summary, that this does not provide an estimate of the overall economic impact of the anti-smoking by-laws. This would, of course, require an estimate of the economic impact of the health impacts of the by-laws. Improved health would mean reduced expenditure on health and increased expenditures on consumer goods and services, thus raising welfare because of the additional consumer goods and services available as well as the improved health itself.

The more limited objective of the Conference Board study is to analyze the impact of the anti-smoking by-laws on consumer spending in restaurants, bars and taverns. The problems with the results of the study arise not so much from the methodology itself (although there are some problems with its concept of permanent income) but from the lack of reliable data on consumer spending and its determinants at the municipal level. The Conference Board tries to overcome these problems by generating its own data, but unfortunately its efforts have produced results of very questionable reliability. An additional problem that calls the results further into question is that not enough time has passed after most of the by-laws were enacted to ascertain their true long-run effect taking into account the possibility that there might be a period of adjustment required for smokers to get used to a smoke-free environment and to return to their old drinking and dining habits.

The Conference Board's concluded that "smoking by-laws have lead to significant reductions in sales volume for bars, taverns and night clubs, with declines in sales varying from 19 per cent to 30 per cent" in Ottawa, Kitchener/Waterloo, Toronto and Vancouver and have lead to reductions in licensed restaurant sales in Toronto and Kitchener/Waterloo of roughly 9 per cent and 14 per cent respectively. The large magnitude of these negative effects are not very credible in the light of all the problems with the analysis identified below.

Problems with the Data

The most basic problem with the study relates to the lack of data on sales for licensed restaurants, and bars, taverns, night clubs for the cities enacting anti-smoking by-laws. The Conference Board uses GST collections data for the particular type of establishments and postal code areas as a proxy for the missing data. This GST data covers suppliers with between $500,000 and $6 million that report quarterly and those earning more than $6 million that report monthly. The estimated

1

sales calculated using the GST data and rate is shown in an appendix to the paper and appears to be extremely erratic from one quarter to another. This raises questions about the exact nature of the data and precisely what it represents.

It would have been useful to have calculated the generated estimate of restaurants and bars series for all of Ontario and to compare it with the monthly sales data from Statistics Canada's *Monthly Restaurants, Caterers and Taverns Survey*. If the two series did not have a very high correlation, this would be an indication that the GST collections series is not a very good proxy for sales and would undercut the reliability of all the analysis presented in the paper. That this could very likely be the case is suggested by the large difference between the elasticity of sales volumes from the survey with respect to permanent income for Ontario and from the estimated series for the individual cities i.e. 2 compared to 10 to 18.

The highly volatile nature of the generated sales variable raises questions about the extent to which the fluctuations in the series are seasonal. It would have made sense to run tests on the raw data to see if the series exhibit stable seasonality. Instead, some sort of "standard pattern that represents both structural and seasonal movements in the data" derived using data for all the cities was used to adjust the data for each of the cities. Exactly what this was and how it was done is never specified.

If the series exhibit seasonality and are not correctly adjusted, then it is inappropriate to include data for a part of the year. But by this criterion, it was not appropriate to include the observation for Q1 2002 in the estimation period as was done in the study. This raises questions about the results for the Ottawa by-law as there are at most only three post by-law observations and they could easily be tainted by seasonality.

The Conference Board study says that it used GST collections to estimate sales. This presumably means that it used net collections after input tax credits, which is the amount actually remitted. Net collections tends to be much more volatile than gross GST on sales because it is reduced by input credits on supplies and capital. For instance, in a month where a bar stocked up on liquor or bought new equipment it would remit a much lower amount of GST even if it registered the same sales. Net collection can even be negative if large rebates are due to the tax filer. The use of net collections would make GST not a very good proxy for sales.

The Conference Board does not make it clear in the study if any adjustments were made to the GST data to reflect collections lags. GST is actually remitted by quarterly filers one month after the end of the quarter and by monthly filers before the end of the next month. To match GST with sales, it is necessary to make a timing adjustment to line up the GST collections with the time the actual sales took place. This is important if you are trying to ascertain the impact of something like the anti-smoking by-law that took effect on August 1, 2001. The sales being measured need to have actually taken place after that date and not just represent filings reported after that date on earlier sales.

Another possible problem with the data is that the number of entities filing GST annually which are excluded could have been declining over time because of the advantage of filing quarterly in terms of getting input credits more quickly. This would cause GST collections of quarterly and monthly filers to increase more rapidly than the underlying trend in restaurant and bar sales and distort the growth in the estimated series.

That there may indeed be serious problems with the data that are distorting the results is suggested by an examination of the raw data for sales of Ontario full service restaurants and drinking places from Statistics Canada's *Monthly Restaurants, Caterers and Taverns Survey*. The sales of Ontario full service restaurants (Chart 1) appears to exhibit a fairly regular seasonality around an upward trend. The sharp decline in the first quarter on 2003 could be attributed to a decline in tourism caused by uncertainty over the pending Iraq War. Apart from this, there appears to be no sharp decline of the magnitude suggested by the Conference Board's analysis. To the contrary, the decline from the third quarter of 2001 to the first quarter of 2002 seems to be a relatively normal seasonal decline. It is possible but unlikely that this results from a sharp decline in the cities with anti-smoking by-laws offset by an increase in the rest of Ontario. But the cities with the anti-smoking by-laws represent such a large of a share of the total that it seems reasonable to believe that a decline in their sales should show up in the total.

Ontario drinking place receipts, which were only about 11 to 12 per cent of the receipts of full service restaurants, do not exhibit as regular of seasonality as full service restaurants (Chart 2), but it is interesting to see how sharply they increased from 1997 to 2000 peaking with a blip in the third quarter of 2000 before falling back. They increased slightly after the third quarter of 2001 only declining significantly in the first quarter of 2003 where uncertainty over the pending war in Iraq was likely a factor. Again unless some very large substitutions are going on between Ontario cities with by-laws and those without, Ontario drinking place receipts do not confirm the Conference Board's conclusion that there was a large decline in cities with by-laws.

The Conference Board did not get the data on the cities with by-laws from Statistics Canada monthly survey because the split between restaurants and bars in not available before 1998. However, since the Statistics Canada data is the best available, it would have been useful to get it and to analyze it to see if there is any evidence of a fall-off in sales in 2000 and 2001 in the affected cities. This analysis would involve deflating the Statistics Canada sales data by the appropriate consumer price index to get sales in real terms and estimating some simpler consumption equations. At the very least, it would be possible to determine if there was any major decline in the real sales, which is something we can not be sure about using the data constructed from the GST collections.

Problems of Insufficient Time to Ascertain Impact

In most cases, the dates that the by-laws were imposed are relatively recent. Consequently, more reliable results would be produced by extending the sample period beyond 2002 Q1. Data for an additional year should now be available and the study should be updated to reflect this more

recent data. This is particularly important for the results for the Ottawa by-law as there are at most only three post by-law observations.

It will require even more time to ascertain the true long-run effect of smoking by-laws taking into account the possibility that there might be a period of adjustment required for smokers to get used to a smoke-free environment and to return to their old drinking and dining habits.

A preliminary look at the more recent data for Ontario full service restaurants and drinking places does not suggest any decline after the first quarter of 2002.

Problems with Explanatory Variables

Permanent income (YPERM) is created by taking a trend of real disposable income in each region. Transitory income (YTRANS) is simply the difference between real disposable income and permanent income. This means that permanent income is simply a trend variable that grows continuously. It does not capture all human and non-human wealth, which generates permanent income. An important exclusion that could have significantly affected the results of the analysis is stock market wealth, particularly in high tech stocks, which peaked in 2000 and subsequently declined sharply. This could have significantly dampened sales of restaurants and bars around the same time the anti-smoking by-laws were being enacted.

The qualitative variable D911 takes on a value of unity in the third quarter of 2001 representing September 11. The third quarter includes July, August and September. Only 19 days after September 11 fall in the third quarter. In effect, the Conference Board is saying that September 11 only likely had an effect on spending for 20 days. This does not seem very plausible. In this light, it is not very surprising that D911 is not significant in any of the equations. If September 11 had any impact at all, it would likely have lasted longer than 20 days and could possibly explain some of the subsequent weakness in bar and restaurant sales. Of course, it would be impossible to get meaningful results if two such dummy variables were included in the equation because of the problem of multicolinearity.

The hotel occupancy rate is not a very good indicator of the trend increase in tourism, but is more of a cyclical indicator. The number of occupied rooms would be a better indicator.

There is an issue of the extent to which spending on restaurants and taverns does not result from the decisions of individual consumers. This would be important if much of the spending on food and drink in the fourth quarter typically results from corporate or government seasonal functions for their employees. For instance, if much of the spending on food and drink in Ottawa resulted from the Christmas parties of high tech firms, then there needs to be some way of capturing this in the equation. If not and if high tech firms were cutting back as they were in the fourth quarter of 2001, then the equation would tend to overestimate spending and incorrectly attribute the shortfall to the anti-smoking by-law. This same problem could also distort the results for the other cities with by-laws, but to a lesser extent because of the larger number of observations for each

after the imposition of their by-laws.

Problems suggested by the Estimation Results

All the estimated equations have an extremely high elasticity of sales with respect to permanent income, which is offset by a very large negative constant term implying a sharply increasing marginal propensity to consume the goods and services of restaurants and bars. The elasticity in the estimated equations for the volume of licensed restaurants, bars, taverns and night clubs was 10.176 for Ottawa, 10.104 for Gatineau, 18.088 for Kitchener Waterloo, and 27.900 for Vancouver. Elasticities this high imply that spending on restaurants and bars will grow much more quickly than income and ultimately account for more than 100 per cent of spending. This suggests that there is something wrong with either the data and/or the specification of the equations. One possibility is that consumer taste has changed over the estimation period in favour of more dining out and public consumption of alcoholic beverages. If so, there is no guarantee that such a trend will continue in line with permanent income if in fact it represents an unrelated change in tastes. But since permanent income just represents a trend, it is capturing the impact of any excluded variables with a trend.

Applying a high income elasticity to permanent income, which is simply a trend variable, means that the actual value of sales of restaurants and bars must grow very rapidly to keep up with estimated. The fact that it does not is captured in the estimated equation by the dummy variable for the by-law which is equal to one at the end of the sample where the trend component is highest. For example, if the trend growth of permanent income is 3 per cent per year or 3/4 per cent per quarter, applying an elasticity of 10 suggests that sales should grow by 7.5 per cent per quarter or 22.5 per cent over three quarters. Any shortfall from this unreasonably high level would spuriously be attributed to the anti-smoking by-law. This could be mitigated if there were a decline in transitory income, but would be relatively minor given the very small estimated coefficients for transitory income.

Interestingly, the coefficient for transitory income for total bar, tavern and night club sales in Ottawa is negative and significant. This means that the results suggest that a decline in income should increase total bar, tavern and night club sales. To ascertain the significance of this it is necessary to know what happened to real personal disposable income after the third quarter of 2001. If it actually fell as might be expected in a slowdown, the estimated equation would be mistakenly attributing the failure of actual sales to increase as a result of this to the effect of the by-law.