The Beer Store, Monopoly Profits and the Potential for Government Revenue: An Economic Analysis

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Abstract

In a recent study conducted for the Ontario Convenience Store Association I find evidence of significant average price differences in specific beer products between Ontario and Quebec, which I attribute to the near monopoly status enjoyed by The Beer Store (TBS). Back of the envelope calculations suggest the existence of significant profits enjoyed by TBS. In this paper, I study differences across specific brands. Employing data on 24 bottle (341 ml) packs collected from major Quebec grocery retailers over many weeks, my results suggest median differences ranging from roughly $3-$6, without accounting for variation in province specific commodity taxes. The need to account for commodity taxes is conditional on whether the beer is manufactured in Ontario. Using the conservative approach of applying a commodity tax correction to all products, I find that median estimates of price differences for a majority of domestic brands, reduces to $1.3-$3.3 However, data from Costco reveals large differences for major imported brands, in comparison to corresponding prices posted by TBS. Specifically, median estimates imply differences ranging from roughly $9-$11, after adjusting for deposit fees, sales taxes, and commodity taxes. A weighted average of price differences between domestic and imported brands suggests a 17% in beer prices between the two provinces. In tandem with the likely existence of significant economies of scale, my results indicate that TBS experiences significant retail profits, which under some assumptions, may be even larger than $700 million. The implications for government revenue are obvious.

1 The opinions expressed in this paper do not reflect the opinions of the Department of Economics at the University of Waterloo or the University of Waterloo. I did not accept any funding from the Ontario Convenience Store Association (OCSA) or from any other organization to write this paper. I take exclusive responsibility for all errors.
I. Introduction

In a recent study that I conducted for the Ontario Convenience Store Association (OCSA), I find evidence of significant price differences between Ontario and Quebec in some widely purchased categories of 24 beer packs (341 ml).\(^2\) The analysis was based on web prices posted by The Beer Store (TBS) and online flyers from Metro and IGA – two large grocery retailers in Quebec. Partly on the basis of these results, I concluded that The Beer Store (TBS) - the agency that is owned by three large foreign firms (Anheuser-Busch InBev, Molson Coors and Sapporo) and is a virtual retail monopoly - makes rather large profits at the retail level, in contrast to the Quebec market, in which grocery stores, large discount retailers, and convenience stores are allowed to sell beer directly to consumers. Simple back of the envelope calculations suggest that these annual profits may be as high as $700 million.

In response, TBS commissioned the Earnscliffe Strategy Group to review my empirical analysis. They suggest that my estimates of beer price differences between the two provinces are confounded by an omission of relevant federal sales taxes and recycling deposit charges with respect to Quebec beer prices. Once these institutional differences are included, the average difference between Ontario-Quebec beer prices shrinks to roughly $3.34. Further, if one takes into account differences in commodity specific taxes, they assert that there is actually no difference in retail prices paid by consumers in both provinces, and therefore, beer manufacturers essentially make the same retail profits in Ontario as they do in Quebec. According to my understanding, this is the primary conclusion of the Earnscliffe Study (hereafter ES).

I think the ES raises some important points that should be addressed in order to ensure sensible and efficient public policy discussion. I will commend the report for shedding light on

the somewhat opaque world of beer pricing, government taxation, and regulation. Therefore, this study re-evaluates my previous findings by using more transparent brand specific data, as opposed to the simple averages that were previously relied upon. I carefully document my calculations in order to ensure an ‘apples to apples’ price comparisons. I begin my analysis by documenting the beer prices that consumers observe before actual purchase. In Ontario, legislation mandates that advertised prices include all taxes and surcharges. On the other hand, in Quebec, federal and provincial sales taxes along with deposit fees are added at the time of purchase. Therefore, I use data downloaded directly from the TBS website and compare them to Quebec prices that DO NOT include all sales taxes and deposit fees. I then calculate the difference between these prices and evaluate the magnitude of change by factoring in relevant federal sales taxes and deposit fees. This is the strategy employed by the ES. As noted by the ES, this net difference then reflects variation in province specific commodity taxes, which are already added to the price. Prices that are corrected for differences in provincial commodity taxes will then reflect the effects of market power.

I study differences in mean and median prices. My decision to employ only sample averages in the previous study was because of the lack of sales data that would enable more accurate weighted averages, and also because of the simplicity associated with simple means. However, the cost of exclusively relying on sample means is the possibility of biased inference if the underlying data are not symmetrically distributed. There are significant provincial differences in mean and median beer prices for four out of six domestic brands. Without taking into account possible differences in commodity taxes, I find beer price differences ranging from roughly $3 to $6.4 for 24 bottle packs. I find that provincial differences for quite a few brands are not eliminated even if we accept that all beer sold by the TBS is subject to the roughly $3.34
difference in commodity taxes between Ontario and Quebec, with median estimates ranging from $1.3-$3.3. However, as is quite clear from the Ontario Ministry of Finance website (http://www.fin.gov.on.ca/en/tax/bwt/rates.html), the beer tax is levied on beer manufactured in Ontario. While there is flexibility in the Alcohol and Gaming Regulation and Public Protection Act (1996) to exempt some beer manufactured in other provinces that may be destined for Ontario, it is clearly incorrect to imply that all beer is subject to the Ontario beer tax.

An obvious inference is that these findings imply that my previous estimates on incremental profits enjoyed by TBS are biased upwards. This is incorrect logic and an example of an absence of underlying economic theory and principles in ES as well as an incomplete understanding by the Earnscliffe Strategy Group of the economic and econometric models that I employed in my previous study. Differences in incremental profits are a result of not only differences in relative prices but differences in costs as well. I did not take into account differences in underlying retail costs in my previous study, as I wanted to be conservative in my profitability estimates. Certainly, the structure of TBS closely resembles well known economic models of a natural monopoly embodied by falling average and marginal costs of production with increases in output.

Data on imported beer sold by Costco adds further credibility on the robustness of my previous findings on profitability as I find extremely large price differences in prices for major imported brands between Costco (in Quebec) and The Beer Store, ranging from $9-$11. Taking this and the above factors into account, I find that my previous estimates of incremental profitability remain unchanged. In this context, I also note that the Earnscliffe Strategy Group incorrectly assumed that I used the entire $9 gap in calculating potential incremental profits for TBS. I did not do that.
I would like to reiterate that this study has not been funded by the Ontario Convenience Store Association (OCSA), or for that matter, any other organization. I think this is important in order to address any concerns that the results of this research may be tainted by the interests of any specific group. I have written this paper in my capacity as a professor in a publicly funded university with a commensurate duty to contribute towards effective public policy. In doing so I believe that I have made a contribution to the literature given that I transparently analyze brand specific differences in beer prices between Ontario and Quebec and the severe absence of contemporary research. This is definitely not the case with the research conducted by Ipsos-Reid on behalf of TBS. A further distinguishing feature of most of the empirical work in this study is a reliance on data over a considerable time period, which ensures that sample summary statistics are not confounded by unobserved shocks such as large temporary discounts. This stands in sharp contrast to the cross-sectional research conducted by IPSOS on behalf of TBS.

II. Analytic Framework

The objective is to evaluate the driving forces behind beer price differences in the two provinces. The determinants of the final price $P'_i$ paid by a consumer in province $i$ can be summarized as follows;

$$P'_i = FEXTAX + PROVEXTAX_i + SALESTAX_i + DEPFEE_i + C'_i + (P^w_i - C^w_i) + (P^m_i - C^m_i)$$

In the above equation, $FEXTAX$ is the common Federal tax paid by consumers in both provinces; $PROVEXTAX_i$ is the province specific commodity excise tax; $SALESTAX_i$ is the combined federal and provincial sales tax; $DEPFEE_i$ is the refundable deposit fee; $C'_i$ is the cost
to the retailer; $P^w_i - C^w_i$ is the wholesale margin; and $P^m_i - C^m_i$ is the margin to manufacturing. $P^w_i$ and $P^m_i$ are the prices charged by the wholesaler to the retailer and by the manufacturer to the wholesaler, respectively. $C^w_i$ and $C^m_i$ are wholesale and manufacturing costs respectively.

For the sake of simplicity, I will for the present assume that wholesaling and manufacturing costs are comparable between Ontario and Quebec. I will also make another restrictive assumption - that the price charged at the wholesale and manufacturing levels in both provinces are similar.

Therefore, if $i = ON$ represents Ontario data and $i = Q$ denotes Quebec data, the difference between retail prices in Ontario and Quebec can be expressed as:

$$P'_{ON} - P'_{Q} = (\text{PROVEXTAX}_{ON} - \text{PROVEXTAX}_{Q}) + (\text{SALESTAX}_{ON} - \text{SALESTAX}_{Q}) +$$

$$(\text{DEPFEE}_{ON} - \text{DEPFEE}_{Q}) + (C'_{ON} - C'_{Q}) + \text{MKTPOWER}$$

The term $\text{MKTPOWER}$ captures the effects of relative differences in market power between the two provinces. Alternatively, it is equivalent to manufacturing and wholesale margins, which I deleted for the sake of notational simplicity. The key point is price differences reflect differences in tax structure, costs, and market power.

In order to empirically measure the above terms, I will use the data available from the ES. The Federal excise tax for both provinces is 31.22¢ per litre. As the authors note, provincial commodity taxes in Ontario are comprised of a “Basic Tax” and a “Volume Tax” equal to 91.62¢ per litre. The relevant sales tax is the Harmonized Sales Tax (HST) of 13% on the price
paid by consumers exclusive of the refundable bottle deposit. The Ontario deposit fee is 10¢ per bottle, which is equal to $2.40 per case of 24 bottles.

The Quebec provincial excise commodity tax rate for beer consumed at home is lower in than in Ontario at 50¢ per litre.³ Quebec sales tax is 9.975% and the federal sales tax is 5%.
Together (with obvious qualification), the sales tax is slightly larger than the Ontario Harmonized Sales Tax. The refundable bottle deposit fee in Quebec is the same as in Ontario, at 10¢ per bottle. Therefore equation (2) reduces to:

\[
P'_{\text{ON}} - P'_{\text{Q}} = (\text{PROVEXTAX}_{\text{ON}} - \text{PROVEXTAX}_{\text{Q}}) + (\text{SALESTAX}_{\text{ON}} - \text{SALESTAX}_{\text{Q}}) + (C^e_{\text{ON}} - C^e_{\text{Q}}) + \text{MKTPOWER}
\]

Therefore, if all factors have been properly controlled for, differences in provincial prices that consumers observe post-purchase, are a function of corresponding differences in provincial excise and sales taxes, costs, and market power. I make this point, because the Earnscliffe Strategy Group consistently imply that since they find no difference in prices after adjusting for taxes, there are no differences in incremental retail profits between the two provinces.⁴

However, equation (3) can be rearranged as


⁴ For example, in their executive summary, which is on page 1 of their report.
\[(P'_\text{ON} - C'_\text{ON}) - (P'_\text{Q} - C'_\text{Q}) = (\text{PROVEXTAX}_{\text{ON}} - \text{PROVEXTAX}_{\text{Q}}) + (\text{SALESTAX}_{\text{ON}} - \text{SALESTAX}_{\text{Q}}) + \text{MKTPOWER}\]

The benefit of doing this stems from the clarity in defining incremental profits between provinces. \((P'_\text{ON} - C'_\text{ON})\) represents retail profits in Ontario while \((P'_\text{Q} - C'_\text{Q})\) denotes corresponding profits in Quebec. The point is that incremental profits are not only a function of differences in prices but also in the marginal costs of doing business. This is not acknowledged by the Earnscliffe Strategy Group, who claims that finding limited price differences is sufficient evidence of no incremental profits. This is clearly not true. Prices could be similar between provinces, and retailers in one province may still be making significant incremental profits, if they have lower marginal costs. This is a key economic point, which unfortunately, the Earnscliffe Strategy Group did not acknowledge. In my previous study, I explicitly adapted a conservative approach and assumed marginal costs to be identical across provinces, and focused on price differences. In this study, I examine the consequences of relaxing this assumption.

III. Differences in Brand Specific Beer Prices

The below table contains summary statistics for data collected data over a twenty-two week period on beer prices of comparable beer products in Ontario and Quebec. The data on beer prices for Ontario are from the TBS website and reflect all surcharges in the form of provincial commodity taxes, deposit fees, and the HST. On the other hand, the Quebec data are from weekly flyers, and I shall accept the Earnscliffe Strategy Group’s assertion that these prices

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5 The exception is for Rickards Red, in which the data are for four weeks
only contain province specific commodity taxes, and sales (federal and provincial) taxes and
deposit fees have not been added.

Table 1. Differences in Sample Means & Medians between TBS & Metro-IGA

<table>
<thead>
<tr>
<th></th>
<th>Molson Canadian</th>
<th>Molson Dry</th>
<th>Coors Light</th>
<th>Budweiser Light</th>
<th>Bud Light</th>
<th>Rickards Red</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Sample Means</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prices for 24 bottle (341 ml) packs</td>
<td>$36.99</td>
<td>$32.36</td>
<td>$36.99</td>
<td>$36.31</td>
<td>$35.95</td>
<td>$39.95</td>
</tr>
<tr>
<td>Beer Store Advertised Price (Sample Mean) – includes HST &amp; Deposit Fee</td>
<td>$26.85</td>
<td>$26.95</td>
<td>$24.83</td>
<td>$26.72</td>
<td>$24.83</td>
<td>$26.64</td>
</tr>
<tr>
<td>IGA &amp; Metro Flyer Price (Sample Mean) – Without Deposit Fee &amp; GST, QST</td>
<td>$10.14</td>
<td>$5.41</td>
<td>$12.16</td>
<td>$9.59</td>
<td>$11.12</td>
<td>$13.31</td>
</tr>
<tr>
<td><strong>Maximum Difference within Brands (between Ontario and Quebec)</strong></td>
<td>$37.95</td>
<td>$31.95</td>
<td>$37.95</td>
<td>$35.95</td>
<td>$35.45</td>
<td>$39.95</td>
</tr>
<tr>
<td><strong>B. Sample Medians</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beer Store Advertised Price (Sample Mode) – includes HST &amp; Deposit Fee</td>
<td>$26.81</td>
<td>$26.81</td>
<td>$24.81</td>
<td>$26.81</td>
<td>$24.81</td>
<td>$26.80</td>
</tr>
</tbody>
</table>
The above table summarizes brand specific sample means and medians. The motivation for using medians as a measure of central tendency in asymmetric data distributions is well established in applied statistics. What would be desirable is the calculation of means weighted by brand specific sales. However, sales data are obviously not publicly available.

With the exception of Molson Dry, Ontario-Quebec price differences based on sample means and medians range from $9-$14. Of these five categories, brand differences for Coors Light, Bud Light, and Rickards Red are in the $12-$14 range. Applying a conservative $6.50 correction to Ontario prices in order to account for differences in deposit fees and sales taxes (with respect to Quebec prices), the gap then shrinks to $5.50 -$7.50. If I apply a $3.34 commodity tax difference to median prices for Molson Dry and Budweiser, I find no difference between Ontario and Quebec for Budweiser, and in fact, Molson Dry prices are lower in Quebec. However, price differences exist for Molson Canadian, Coors Light, Bud Light, and Rickards Red.

In order to offer more clarity, Table 2 redoes the analysis by deducting the deposit fee and sales tax for Ontario in one column, and also deducting the difference in provincial taxes in another column. What emerges is the importance of differences in provincial commodity taxes between Ontario and Quebec.
Table 2. Decomposing Brand Specific Differences in Prices

<table>
<thead>
<tr>
<th>Brand</th>
<th>Beer Store Advertised Price (Sample Median) includes HST &amp; Deposit Fee</th>
<th>Eliminating HST &amp; Deposit Fee Difference ($3.34)</th>
<th>Eliminating Commodity Tax Difference (Sample Median) – Adjustment for Deposit Fee &amp; GST, QST not required</th>
<th>Difference without Commodity Tax Adjustment</th>
<th>Difference with Commodity Tax Adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molson Canadian</td>
<td>$37.95</td>
<td>$31.46</td>
<td>$28.12</td>
<td>$26.81</td>
<td>$4.65</td>
</tr>
<tr>
<td>Coors Light</td>
<td>$37.95</td>
<td>$31.46</td>
<td>$28.12</td>
<td>$24.81</td>
<td>$6.65</td>
</tr>
<tr>
<td>Budweiser</td>
<td>$35.95</td>
<td>$29.69</td>
<td>$26.35</td>
<td>$26.81</td>
<td>$2.88</td>
</tr>
<tr>
<td>Bud Light</td>
<td>$35.95</td>
<td>$29.69</td>
<td>$26.35</td>
<td>$24.81</td>
<td>$4.88</td>
</tr>
<tr>
<td>Rickard’s Red</td>
<td>$39.95</td>
<td>$32.23</td>
<td>$29.89</td>
<td>$26.80</td>
<td>$6.43</td>
</tr>
<tr>
<td>Molson Dry</td>
<td>$31.95</td>
<td>$26.15</td>
<td>$22.81</td>
<td>$26.81</td>
<td>-$0.66</td>
</tr>
</tbody>
</table>

Positive price differences of $1.3-$3.3 persist for Molson Canadian, Coors Light, Bud Light, and Rickards Red. As illustrated in the analytic framework section, if the marginal costs of production and distribution are comparable between provinces, then this difference along with cost differentials reflect the effects of market power in Ontario. From another perspective, taking the data in column (2), and eliminating the total Ontario commodity tax ($7.43) results in net prices of $24.03, $24.03, $22.26, $22.26, and $25.80 for Molson Canadian, Coors Light,
Budweiser, Bud Light, and Rickard’s Red. The corresponding net of commodity tax prices for Quebec for the same brands (in the same order) based on data in column (4) are $22.72, $20.72, $22.72, $20.72, and $22.71. Eliminating the $2.56 Federal Excise Tax results in prices of $21.47, $21.47, $19.70, $19.70, and $23.240 for Molson Canadian, Coors Light, Budweiser, Bud Light, and Rickard’s Red, respectively, in Ontario and in prices of $20.16, $18.16, $20.16, $18.16, and $20.15 for the same brands (in the same order) in Quebec.

*The Ontario Beer Tax*

As noted in the ES, the relevant Ontario commodity tax on 24 bottle packs (341 ml) increased from 89.95 ¢ per litre to 91.62¢ per litre on March 1, 2013, implying a total provincial tax of $7.50 per case of 24 x 341ml bottles. In contrast, the Quebec beer tax is 50¢ per litre. Using an average of the Ontario taxes before and after the amendment, results in an Ontario-Quebec tax differential of $3.34 for a 24 pack of bottles (341 ml).

However, it is also important to note that not all beer brands are necessarily subject to the Ontario beer tax. The information available from the Ontario Ministry of Finance website (http://www.fin.gov.on.ca/en/tax/bwt/rates.html) summarizing relevant provisions of the Ontario Alcohol and Gaming Regulation and Public Protection Act (1996), suggests that the beer tax is applicable only to Ontario beer manufacturers. On the other hand, after discussions with analysts at the Ontario Ministry of Finance, it is my understanding that the provisions of the Act are broad enough, that beer manufactured in other provinces - but that are specifically destined for Ontario, - are also subject to the Ontario specific Beer Tax.

The question is then: what brands are subject to the Ontario Beer Tax? The implication is that commodity tax differentials may disappear for some brands. More important, this point is an
important omission of information in ES, which affects the calculation of the relevant Ontario-Quebec price gap, specifically with respect to foreign brewed brands. Discussion with the Ontario Ministry of Finance suggests that international brands are imported by the LCBO, which may then be sold to TBS at a markup reflecting the Ontario beer tax. The relevant question is: what is the empirical magnitude of price differences for these brands?

**Including Data from Discount Retailers**

I could not find available online prices (posted by Quebec groceries) for a reasonable number of imported brands. Therefore, I collected data on prices of 24 bottle packs (330 ml) for three major imported brands – Heineken, Corona, and Stella Artois - through on-site visits to specific Costco stores in Quebec. The results are summarized below.

**Table 3. Decomposing Prices for Imported Brands**

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Heineken</td>
<td>$46.95</td>
<td>39.42</td>
<td>$36.12</td>
<td>$24.99</td>
<td>$14.43</td>
<td>$11.13</td>
</tr>
<tr>
<td>Corona</td>
<td>$44.95</td>
<td>37.65</td>
<td>$34.35</td>
<td>$24.99</td>
<td>$12.66</td>
<td>$9.36</td>
</tr>
<tr>
<td>Stella</td>
<td>$46.95</td>
<td>39.42</td>
<td>$36.12</td>
<td>$24.99</td>
<td>$14.43</td>
<td>$11.13</td>
</tr>
</tbody>
</table>
In contrast to domestic brands, the difference between Costco and Beer Store prices is quite large in magnitude. Even after including all possible adjustments, 24 pack bottles (330 ml) of imported brands are roughly $9-$11 more expensive in Costco outlets in Quebec relative to TBS. I also checked online prices at the LCBO website, and found them to be comparable to TBS prices.

IV. Natural Monopoly and Economies of Scale

The empirical results suggest positive but small differences in prices for domestic brands, and quite amplified differences for imported products. A natural implication is that profit margins on domestic brands must be necessarily limited. As discussed in Section II, this is flawed inference. Profit margins are a function of price as well as cost differences.

However, why should there be significant cost differences in beer retailing between Ontario and Quebec? First, to clarify, I think it is fair to assume that costs related to manufacturing and wholesaling are comparable between the provinces. What should be different, given the market structure, are the costs associated with retailing. In this respect, the Ontario model fits well with the well-established theory of a ‘natural monopoly’, in which the firm is required to expend considerable upfront resources – usually on infrastructure- and therefore, initially experiences very high average and marginal costs of doing business. However, once the infrastructure is established, in this case, the retail outlets of TBS, then average and marginal costs (defined in terms of beer sold) drop with increases in output. In other words, retail delivery becomes cheaper (per unit of output), as sales or throughput increases for a given infrastructure of retail outlets. On the other hand, retail delivery is quite different in Quebec, being done through hundreds of grocery and convenience stores, and retail discounters such as Costco. The
beer industry must bear some of the costs of servicing these stores. Hence, I think it reasonable to assume a conventional upward sloping marginal cost curve for the Quebec beer industry.

These concepts are illustrated in Figure 1. I assume that preferences for beer are similar in both provinces and the demand curve is the same and relatively inelastic. The marginal cost curve for Quebec is upward sloping (average cost is assumed to be similar to marginal cost and is omitted for brevity). However, the average cost curve for Ontario is downward sloping because of economies of scale. Prices in Ontario ($P_{ON}$) are higher relative to Quebec ($P_Q$). The incremental profits in Ontario from price differences (relative to Quebec) are given by rectangle abcd. However, total incremental profits to the Ontario beer industry consist of rectangle abcd and rectangle pbgi, which represents higher profits stemming from lower business costs. This is because total costs of production in Quebec are $pg0Q_{ON}$ (with respect to quantity $Q_{ON}$) while corresponding costs in Ontario (with respect to $Q_{ON}$) are $bi0Q_{ON}$. In summary, my previous research focused on estimating the magnitude of profits from differences in relative prices and ignored possible differences from differences in relative costs, therefore resulting in likely under-estimates of differences in incremental retail profits between the two provinces.

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6 In order to maintain a simple diagram, I omit the marginal revenue curves.
Calculating Incremental Profits

What then is a reasonable estimate of differences in incremental profits? Estimates based on domestic brands suggest a $1.3-3.3 price difference between Ontario and Quebec, which is equivalent to a roughly 6%-16% difference (relative to an Ontario net of federal and provincial tax price of $21.12). However, estimates based on imported brands are much higher at $9-$11, and suggest a roughly 31%-38% price difference (relative to an Ontario net of tax price of $29). A reasonable balanced price differential would probably be between 10%-20%. However, more rigorous methodology should be relied upon in order to calculate a sensible weighted average of domestic and imported brands. Assume a 75%/25% break up in sales value between domestic and imported beer brands. Therefore, if I use a $2.3 figure for domestic brands and a $10 for imported brands, I obtain a weighted average of \((0.75\times2.3) + (0.25\times10) = 4.22\). Rounding this
estimate to $4, and relative to an Ontario net of tax price of $21.12, this is equivalent to a roughly 19% price difference in comparison to Quebec prices. However, I will use an estimate of 17% in order to account for the fact that the denominator increases taking into account the weighted average of imported brands.

However, given the likely presence of significant economies of scale in Ontario, this figure does not fully capture differences in incremental profits. A reasonable ballpark estimate of differences in relative costs is roughly 10%. If this is true, then my previous estimates on incremental profits in Ontario remain unchanged. What is required is a rigorous method to estimate cost differentials given the absence of publicly available data.

Estimates of marginal costs can be inferred from the Lerner Index (L), which measures profit margins associated with market power, relative to firm level price elasticities of demand. The specific equation is:

$$ L = \frac{(P - MC)}{P} = \frac{1}{\epsilon} \quad (4) $$

Where $P$ is price charged by the Beer Store, $MC$ denotes marginal costs of the Beer Store, and $\epsilon$ is absolute value of the firm level price elasticity of demand. Therefore, profit margins can be backed out using estimates of $\epsilon$. In this respect, my understanding is that the price elasticity of demand for individual categories of beer is quite high, ranging from -4 to -5.\(^7\) I shall employ a conservative estimate of -4, which implies relative price margins of 25%. Further algebra reveals that for this to be true, there must be a 33% difference between price and marginal cost. Therefore,

\(^7\)Pinkse and Slade (2004) find an average brand own-price elasticity of −4.6, while Hausman et al. (1994) obtain an average own-price brand elasticity of -5.
\[ P - MC = 33\% \]  

However, using the notation from figure 1, the difference between The Beer Store’s price and marginal costs can be decomposed as;

\[ P - MC = (P_{ON} - P_Q) + (P_Q - MC_Q) + (MC_Q - MC_{ON}) = 33\% \]  

In other words, The Beer Store margins are simply the sum of the difference between Ontario and Quebec price, the difference between Quebec price and Quebec marginal cost, and the difference between Quebec cost and Ontario cost. I have already offered estimates suggesting that the difference between Ontario and Quebec price is roughly 17%. Therefore, if the Beer Store profit margin is 33%, it must be that the sum of the difference between Quebec price and Quebec marginal cost and the difference between Quebec marginal cost and Ontario marginal cost is 16%. Assume that beer margins in Quebec are a generous 10%. This would then imply that cost differences between Ontario and Quebec are a modest 6%, and therefore, the incremental profit margin that The Beer Store enjoys on a per unit basis is 17% + 6% = 23%, which is very close to the 25% figure I suggested in my previous study. Again, this figure could be a severe underestimate of true incremental profits if retail margins in Quebec are lower than 10%, and cost differentials between Ontario and Quebec are higher. For example, if beer margins for groceries and convenience stores in Quebec are at 5%, then the cost difference between Quebec and Ontario increases to 11% and implied profit margins for TBS are 28%.
Econometric Analysis

In my previous study, I employed a multivariate regression model in order to estimate average price differences between Quebec and Ontario beer prices (in the sample). The ES did not discuss the econometric model, The model was:

\[ P_{\text{tot}} = \beta_0 + \beta_1 P_{\text{iqt}} + B_i + T_t + \epsilon_{ijt} \]

As was the case, in my previous study, \( P_{\text{tot}} \) is the price of a brand \( i \) in Ontario at time \( t \). \( P_{\text{iqt}} \) denotes the corresponding price of same brand \( i \) (averaged across stores) in Quebec at time \( t \). Prices for both provinces are *exclusive of sales taxes, deposit fees, and differences in commodity taxes*. \( B_i \) is a vector representing brand specific dummies while \( T_t \) is a vector of month specific dummy variables. The use of these dummy variables is meant to control for the potentially confounding effects of idiosyncratic brand or week specific shocks. \( \epsilon_{ijt} \) is the error term which captures the effects of other unobservable factors that might impact beer prices in Ontario.

I run the model as a levels specification. Although I explained the interpretation of parameter estimates in my previous study, I shall repeat the important points. In a levels model \( \beta_1 \) yields the change in the beer price of a specific product associated with a corresponding $1 change in the price of the same product in Quebec. These estimates yield an associated change in a particular direction as well an “on average” effect. Estimating the above model allows me to estimate conditional mean differences between Ontario and Quebec prices.
Table 4. OLS Estimates of the relationship between Ontario and Quebec Prices

<table>
<thead>
<tr>
<th></th>
<th>Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Quebec Price</td>
<td>1.3539</td>
</tr>
<tr>
<td></td>
<td>(0.7674)*</td>
</tr>
<tr>
<td>Brand Dummies</td>
<td>Yes</td>
</tr>
<tr>
<td>Time Dummies</td>
<td>Yes</td>
</tr>
<tr>
<td>Adjusted R Square</td>
<td>0.8105</td>
</tr>
</tbody>
</table>

Notes: These regression estimates are based on a sample of seven brands collected over a twenty two week period. Standard errors are in parentheses. *** denotes statistical significance at the 1% level.

The results suggest that a $1 increase in pack prices in Quebec is significantly associated (at the 10% level) with a $1.35 increase in Ontario prices, on average, across different brands and over time. Further, the specific model explains 81% of the variation in the dependent variable, which is a remarkably good fit. What is the intuition behind these results? As I explained in my previous paper, it is reasonable to assume that beer prices in Ontario and Quebec are impacted by similar factors – such as changes in the prices of inputs. An increase in the price of an input usually results in a higher retail price for the product. The above findings imply that the specific retail price effect for Ontario as a result of such a common shock – independent of federal and provincial taxes – is much more amplified relative to the change in the retail price in Quebec. While I am careful on attributing a causal relationship, this finding is consistent with standard text book models, which clearly demonstrate that changes in retail prices in response to cost or input price shocks are greater, in less competitive markets.
Specifically, that cost shocks can be used by firms in imperfectly competitive markets to pass on a more than proportionate increase in prices to consumers. In other words, this is further evidence on the existence of market power effects specific to Ontario, above and beyond an analysis of simple sample statistics.

V. Conclusions and Policy Recommendation

In a previous study conducted for the Ontario Convenience Store Association, I estimate that as a result of the monopoly status given to it by the province, The Beer Store makes incremental profits equivalent to roughly $700 million, relative to retail profits in Quebec. Using Quebec as a benchmark is important given that the market for beer is relatively competitive, with consumers having the choice of purchasing beer from groceries, large discount retailers, and convenience stores. The lobbyist firm The Earnscliffe Strategy Group has released an accounting study, which suggests that I made errors in some of my calculations, and when corrected, implies that there are no price differences between similar beer products sold in the two provinces. In other words, The Beer Store does not enjoy any incremental profits relative to retailers in Quebec.

As I stated earlier, I commend the Earnscliffe Strategy Group study for being a clearly written piece of research that adds to our understanding of inter-provincial tax differences with respect to beer. Unfortunately, the Earnscliffe Strategy Group study is deeply flawed in terms of its underlying economics. Differences in incremental profits are not only a function of differences in relative prices, but costs as well. The fact that the study can claim an absence of incremental profits in a market where: (1) there is virtually one retail outlet for many products

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Please refer to Baker and Rubenfeld (1999) for a comprehensive discussion of empirical methods in identifying oligopoly behaviour.
(The Beer Store); (2) the firm enjoys obvious economies of scale given existing infrastructure; and (3) the product is well established to be relatively price inelastic in demand - is extremely surprising. Further, the fact that it does not acknowledge that differences in incremental profits are also a function of cost differences - at the bare minimum, as a caveat – is disappointing. The Earnscliffe Strategy Group study does not attempt to conduct any analysis of a different sample of beer brands across provinces. On this basis it falls significantly short of constituting a contribution to public policy.

What is also disappointing of the Earnscliffe Strategy Group study is its exclusive focus on calculated price differences. My previous study was more expansive in its scope - a fact that is ignored by the ES. I conducted econometric analysis and also discussed relevant theoretical models that are critical in evaluating the likely existence of incremental profits in beer retailing between Quebec and Ontario. Ignoring these analyses (in my previous study) will naturally result in a biased and flawed inference. What is perhaps more disappointing in the ES, is an incorrect application of basic economic principles. On page 8, the authors state: “Claims of higher Ontario brewer or Beer Store profits being responsible for price differences between the provinces are not supported by the corrected data.” Profits are not responsible for prices. Prices and costs determine firm profits.

This study contains revised estimates of Ontario-Quebec price differences in specific brands of beer. I attempt to conduct my analysis in a transparent manner, to demonstrate that the proper adjustments in sales taxes, deposit fees, and commodity taxes have been made. The results of this study demonstrate a roughly 17% difference in weighted average prices of domestic and imported brands of beer between Ontario and Quebec. Counterfactual analysis
based on economic theory suggests profit margins of roughly 33%. At the very least, this result implies the existence of significant cost differences that also impact profit margins.

The Beer Store commissioned Ipsos Reid to survey beer prices in Quebec, Alberta, and Ontario and conduct a comparison with beer prices in Ontario. In their study (available at http://www.ipsos-na.com/news-polls/pressrelease.aspx?id=6173), Ipsos Reid finds that “when prices in the other provinces are normalized to Ontario’s beer tax rate to create an “apples to apples” comparison, the competitiveness of Ontario’s beer prices improves further: Quebec prices normalized to Ontario’s tax rate are 11% - 38% more expensive than Ontario, British Columbia’s prices are 42% - 48% more expensive and Alberta’s prices 40% - 47% more expensive.” In essence, the study extracts the provincial specific commodity tax from beer prices in Quebec, British Columbia, and Alberta, and then replaces it with the Ontario specific tax.

This is an extremely odd calculation. As has been discussed, provincial beer taxes are higher in Ontario than in Quebec. Therefore, there is an extremely strong likelihood that Quebec prices would naturally become higher if the Quebec commodity tax is replaced by the Ontario tax. The proper methodology is to simply account for all province specific policies and regulations and then compare residual prices, which by definition, should reflect differences in market power. What is also of concern is that the survey seems to be based on single store visits. A more acceptable methodology would be based on multiple visits to the same store over time in order to control for unobserved shocks that are store specific, and would then confound the calculation of sample means and other summary statistics.

This is why this paper is an important contribution to policy. In most cases, the data I used were collected over a twenty two week period, allowing me to smooth out shocks and offer reliable estimates that are not “cherry-picked”. There are instances in my data where for some
weeks, the difference between Ontario and Quebec prices are larger than median estimates that I rely upon. However, I choose to present conservative summary statistics over a reasonable period of time. I am not aware of any other study that has attempted to evaluate differences in beer prices between Ontario and Quebec over a relatively long period of time. To the best of my knowledge, this is also the first study that has used econometric methods in order to evaluate such price differences – excluding of course, research that has estimated specific price elasticities of demand.

In 2009, The Beer Store sold more than 7,250,000 hectolitres (725,000,000 litres) of beer. Statistics Canada data for 2010 (CANSIM Table 183-0015) implies a per litre beer price of $3.67 (calculated by dividing value of sales by volume).\(^9\) If we assume a conservative 25\% incremental profit margin (based on differences in prices and costs), then estimated profits are \(0.25 \times 3.67 \times 725,000,000 = \$665,187,500\). On the other hand, a slightly larger estimate of 28\% yields an incremental profit estimate of roughly \$745 million.

Caveats should be emphasized. The golden standard in empirical analysis would be data on more brands over a long period of time along with information on associated sales, which would allow me to calculate sales weighted averages. However, much of this information is confidential. On the other hand, I only rely on data for common and well-known brands, which should yield reliable results. The key shortcoming is the lack of cost data. But I have used what I view to be reasonable economic and empirical methods to form plausible estimates of costs. I would welcome conducting another study with actual data from The Beer Store, in order to verify the robustness of the findings discussed in this paper. Another way to gauge the reasonableness of my estimates is by looking at annual profit estimates of the other liquor monopoly, the Liquor Control Board of Ontario (LCBO) which recently disclosed annual profits.

\(^9\) This figure includes discounts and rebates, but not the HST.
of more than $1.7 billion. The LCBO has more outlets than The Beer Store and pays its employees unionized wage rates. LCBO outlets are also typically not ‘bare-bones’. I would find it unsurprising if per litre sales costs for the LCBO are higher than that of The Beer Store. The implications for TBS profits are obvious.

The results of this paper should not be surprising. Indeed any assertion that beer manufacturers make lower profits in Ontario compared with Quebec should be met with some skepticism, given the differences in retail delivery. I emphasize that this study is not an advocacy for lower beer prices. There are well known benefits to maintaining higher beer prices through different policy mechanisms. What is important to ask is where higher revenue from beer sales should go. The province has given beer manufacturers the legal right to a retail monopoly in the province. This is unparalleled in most OECD countries. This paper establishes the existence of significant incremental profits that can be reasonably linked to these specific institutional features. As an economist, I fully endorse that government should not significantly extract business profits, if firms earn such profits through competition and efficiently offering innovative goods and services, which consumers demand. On the other hand, giving a few firms a legal monopoly, which allows them to earn significant profits, and not expecting some corresponding rents in return – is something that I find quite perplexing. This is especially compounded by the inelastic nature of beer demand, which consistent with Ramsay pricing, makes it an attractive commodity to raise revenue from with minimal distortion and inefficiencies.
References


