THE PRICE OF BEER IN ONTARIO AND QUEBEC

By

Debra J. Aron, Ph.D.[1]

May 2014

1. INTRODUCTION

A. Background

Beer is a very popular beverage in Canada. In 2013, beer accounted for eight percent of all household spending on food and beverages in Canada.[2] In 2012, Canadians bought the equivalent of 235 bottles of beer per person for off-premise consumption.[3]

Beer is sold subject to a variety of taxes, levies, and regulatory constraints that affect the way consumers access and purchase beer, the pathways through which brewers compete with each other, the prices consumers pay, and the revenues brewers receive. While there are some taxes and fees imposed at the federal level that apply to beer sold in any province, the majority of the tax load on beer is levied at the provincial level, where tax levels and structures can vary significantly. Beer is also sold in substantially different retailing environments across provinces due to different regulatory policies at the provincial level.

In this paper I focus on two provinces, Ontario and Quebec. In Ontario, most beer for off-premise consumption is sold at either The Beer Store, or at government-owned Liquor Control Board of Ontario ("LCBO") stores. LCBO stores sell primarily wine, spirits, and beer in smaller package sizes. The Beer Store, also known as "TBS," is a privately owned, government-regulated chain of retail outlets that sells a full selection of beer products representing approximately 75 percent of provincial retail beer sales. In Quebec, beer is distributed (i.e., delivered to points of sale) either by government-owned Société des alcools du Quebec ("SAQ") stores, or by private distributors, including brewers. The retail channels for beer in Quebec include SAQ stores, grocery stores, and convenience stores.[4]

Because of differences in the legislative and regulatory requirements related to beer distribution and retailing in the two provinces, the competitive framework in each province is somewhat different. In Quebec, retailers may set different prices from one another for the same beer in order to compete with each other, and are free to offer just a limited variety of beers. Prices may vary from region to region or store to store depending on the availability of other

---

[1] Dr. Debra Aron is Adjunct Associate Professor at Northwestern University, and a Managing Director at Navigant Economics. Outstanding research assistance was provided by Sophie Yang.

[2] "The Value of Beer in Canada," The Conference Board of Canada, 2013.

[3] "The Value of Beer in Canada," The Conference Board of Canada, 2013.

[4] In Quebec the only beer sold in SAQ stores is beer that is not available in grocery and convenience stores.

brands in the store and in the area, and the proximity of competing retailers, among other factors, subject to minimum price requirements established by the Quebec Régie des alcools.[5]

In Ontario TBS has an open listing policy. Each brewer has the opportunity to sell any brand and packaging of beer at any or all TBS stores that it chooses, subject to paying a one-time listing fee on a per-store per-SKU basis, and each brewer is free to set and change its selling prices. Under the provincial *Liquor Control Act,* prices for the same beer product are uniform at all retail outlets where the beer is available (including LCBO stores, TBS stores and agency stores).[6] TBS currently operates 448 stores.[7] In addition to its one-time listing fee, TBS also charges brewers a service fee for supplying retailing services and managing the collection of empty bottles.[8] The individual brewers set their own beer prices subject only to LCBO's approval and minimum price requirements. TBS does not restrict or limit the beer products sold through its stores nor does it play any role in setting product prices. In TBS stores, brewers set prices taking into account the fact that brands compete with other brands head-to-head in each store and at a price that must be uniform across the entire TBS system.[9]

The high levels of beer taxation in Canada result in a significant percentage of retail selling prices being comprised of tax. While federal beer tax rates in the provinces of Ontario and Quebec are identical, the provincial levels of taxation are considerably different. For example, on a case of 355ml 24-cans the provincial commodity tax in Ontario is 234 percent of that in Quebec: $9.95/case versus $4.26/case, respectively.[10] Overall, in 2013, 44 percent of the average beer selling price on a per litre basis in Ontario was tax, while 33 percent of the average beer selling price at Quebec was tax.[11] These tax differences necessarily have a significant effect on the relative prices paid by consumers in the two markets, and on the relative prices received by suppliers in the two markets. It is therefore important to explicitly account for these tax differences when conducting a pricing comparison across jurisdictions with different tax structures.

---

[5] The minimum price of beer is determined by the Régie des alcools, des courses et des jeux (the Quebec Liquor Control Board) and it follows the cost of living on a yearly basis. See Canadian Association of Liquor Jurisdictions, http://www.calj.org/Articles/Publications.

[6] "Alcohol Retailing Deregulation: Implication for Ontario," TBS, Greg Flanagan, February 2014, at page 4.

[7] "Alcohol Retailing Deregulation: Implication for Ontario," TBS, Greg Flanagan, February 2014, at page 13.

[8] The TBS basic service fee covers product receipt at retail, inventory management, selling products to consumers and managing the return of empty containers. The basic service fee is tiered based on sales volume and ranges from $3.77 to $4.28 per case in 2013. In 2013, the one-time listing fee for new product listings was $2,848.93 plus $227.92 per store per SKU for the first 233 stores and $53.56 per store for stores beyond the first 233 stores.

[9] Provincial regulations administered by the LCBO permit brewers to modify prices on a weekly basis with the exception of the month of December.

[10] See Table 2 for tax rates in both provinces. The figures $9.95 and $4.26 in the text are calculated as follows: ($0.7402+$0.176)*355*24/1000+$0.0893*24=$9.95 and $0.5*355*24/1000=$4.26.

[11] See Table 3. TBS: Pre-tax price $2.28/post-tax price $4.07=56%. 1-56%=44%. AC Nielsen: Pre-tax price $2.8/post-tax price $4.15=67%. 1-67%=33%.

The purpose of this paper is as follows:

1. to examine the prices of beer sold for off-premise consumption in Quebec and Ontario to determine the extent to which prices vary between the two provinces; and
2. to assess whether, after taking into account the different tax structures, the prices paid by consumers and the revenues to the suppliers differ between the two provinces and define the scope and extent of those differences.[12]

In the following section I summarize my findings. In Section II, I describe the data I have obtained, the steps I took to prepare the data, and the statistical analyses I performed to compare beer prices in Ontario and Quebec. Section III contains concluding remarks.

B. Summary of Findings

As an economic matter, the price paid by consumers will be higher in a market with higher taxes than in a market with lower taxes, all else equal. Because, as noted above, taxes on beer in Ontario are significantly higher than taxes on beer in Quebec, we would expect to find that absent other differences, post-tax prices in Ontario would be higher than post-tax prices in Quebec. Of particular interest, then, to analyze beer prices in the two provinces is a comparison of the prices with all taxes removed. Hence, I compared both (i) pre-tax prices (i.e., the prices of the beer prior to the application federal and provincial sales taxes, provincial commodity tax as well as federal excise tax), which represent the prices actually received by suppliers[13] and (ii) post-tax prices (i.e., prices after the application of federal and provincial sales taxes, provincial commodity tax as well as federal excise tax), which represent the prices actually paid by the consumer at retail.

The key findings of the analysis were as follows:

1. Analysis of Pre-Tax Prices

- The volume weighted average pre-tax price per litre for all beer products sold in Ontario was $0.52 lower than the volume weighted average pre-tax price of all beer products sold in Quebec. This is a difference of 18.1 percent.

- The volume weighted average pre-tax prices for the bestselling package sizes --- six, twelve and twenty-four --- were all lower in Ontario than in Quebec.[14] For example, the volume weighted average pre-tax price of a 12-pack of cans was $2.34 per litre in Ontario, and $2.91 per litre in Quebec, a 19.6 percent difference.

[12] I excluded on-premises consumption from my analysis as the AC Nielsen data do not include on-premises channels (on-premise consumption includes hotels, restaurants, bars, nightclubs and similar establishments).

[13] The taxes applied to beer sales include federal and provincial sales taxes, provincial commodity taxes, and federal excise taxes.

[14] The bestselling package sizes in Quebec are 24, 12, 6, 1 and 20 packs. The bestselling package sizes in Ontario are 24, 12, 28, 15 and 6 packs.

- The pre-tax price of beer paid at the 50th percentile of consumption --- that is, the price at or below which 50 percent of the litres of beer were purchased --- was $0.35 per litre, or 14.1 percent lower in Ontario than in Quebec; in fact Ontario's pre-tax per litre prices were lower than Quebec's at every percentile of consumption.

- Thirty-five percent of the total litres of beer sales sold at TBS during 2013 were sold at a pre-tax price that was lower than the lowest pre-tax price observed in the province of Quebec, which was $2.02.

- Pre-tax prices in Ontario were $0.23, or 8.7 percent, lower than pre-tax prices in Quebec when comparing beer products that are common to both markets (i.e., products sold in the same package sizes and same container types in both provinces), and holding constant the volume of consumption in the two provinces at the volumes purchased in Ontario (that is, looked at as an Ontario-weighted price index).

- The volume weighted average pre-tax prices for the top 10 best-selling brands in Ontario were one percent to 23 percent lower in Ontario than in Quebec, except for Coors Light, which was sold at the same pre-tax price in both provinces, and Bud Light, which was sold at pre-tax prices one cent per litre more, or less than one percent higher, in Ontario. One of the top 10 brands in Ontario—Lakeport Pilsner—sells at a lower pre-tax price by far than any of the top 10 brands in Quebec, but is not sold in Quebec at all. For the best-selling brands in Quebec, Molson Dry and Export --- which are not in the top 10 in Ontario --- are nevertheless sold at a lower pre-tax price in Ontario. Other than Bud Light, the only brand among the top 10 in Quebec that sells at a lower price in Quebec than in Ontario is Stella, which is 15 cents per litre cheaper in Quebec.

2. Analysis of Post-Tax Prices

- Despite the much higher taxes in Ontario, the volume weighted average post-tax price per litre for all beer products sold in Ontario was $0.08 *lower* than the volume weighted average post-tax price of all beer products sold in Quebec.

- Despite the much higher taxes in Ontario, the volume weighted average post-tax price for two of Ontario's best-selling brands of beer was lower in Ontario than in Quebec.

- On a post-tax basis, beer products sold only in Ontario (not in Quebec) have a lower volume weighted average price than do beer products sold only in Quebec (not in Ontario), and a lower price than beer products sold in both provinces.

- The volume weighted average post-tax prices in Ontario are lower than those in Quebec for 6-packs of bottles, 6-packs of cans, and 12-packs of cans. The volume weighted average post-tax prices in Ontario are higher than those in Quebec for 12-packs of bottles, 24-packs of cans, and 24-packs of bottles.

3. Brand Availability

- Consumption was less concentrated in the best-selling brands in Ontario than it was in Quebec, indicating a larger variety of brands in Ontario that consumers choose to enjoy in significant quantities.

II Data Analysis

A Data Description

In order to compare beer prices in Ontario and Quebec, I obtained product level Ontario beer sales data from TBS ("the TBS data") and product level beer sales data for Quebec from AC Nielsen ("the AC Nielsen data"). The beer product sales data I received from TBS included weekly data for 2013. TBS staff has confirmed that these data include all beer sales made through TBS, which represents approximately 75 percent of retail beer sales in Ontario. The dataset includes transaction date, sales revenue, quantity of packs sold, beer brand, container type, container volume, pack size, and type of transaction.[15] The sales revenue variable includes provincial commodity taxes (i.e., basic commodity tax, volume levy, and environmental levy) and federal excise tax, but excludes federal and provincial sales taxes (i.e., the 13 percent Harmonized Sales Tax).

The AC Nielsen data also cover the year 2013 and are also provided by week. The AC Nielsen data capture for each transaction week the price, quantity of packs sold, product "Stock Keeping Units" ("SKUs") (i.e., beer brand, pack size, container type, container volume, and alcohol percentage), manufacturer, price segment, and retail channel.[16] The data are limited to sales through large grocery and select big box stores, which represent between 30 and 40 percent of overall beer sales in Quebec. I understand that the sales price in the AC Nielsen data includes provincial commodity taxes and federal excise tax, but excludes federal and provincial sales taxes (i.e., sales taxes totaling 14.975 percent). There is no environmental levy or volume levy in Quebec.

TBS also provided a list of non-refillable containers in the TBS data that are subject to the $0.0893 per container environmental levy.

In my analysis I examine prices in a variety of ways, including by product, brand, and package size. For purposes of my analysis, I define a "product" as a combination of brand, number of containers in the package, container type, and container volume. An example of a product would be a 24-pack of 341ml bottles of Bud Light. In that example, the brand would be Bud Light. Table 1 summarizes the number of brands and products that appears in the TBS data for Ontario, and the AC Nielsen data for Quebec.

---

[15] The type of transactions variable includes counter sales, LCBO delivery, agency sales/delivery, and SOP sales.

[16] The retail channel ("Banner") includes IGA, Loblaws, Maxi, Metro, SuperC, Provigo and "Total Nielsen." I understand the price in the "Total Nielsen" banner in a given week is the weighted average of the prices in each included retail channel (i.e., each banner) that week; therefore I included only the "Total Nielsen" banner in my analysis.

B. Data Preparation

I evaluated the beer prices for January 1st to December 31st 2013. I evaluated only retail sales for this analysis.[17] Retail sales represented approximately 78 percent of the total beer sales volume at TBS in 2013. I excluded all kegs, boxes, and pump products from my analysis.[18] Bottles and cans represent more than 99 percent of the total sales in both the AC Nielsen data and the TBS data. I excluded the products in the AC Nielsen data with a pre-sales-tax price of less than the lowest legal minimum price in Quebec, on the assumption that these prices were errors in the data.[19] I also excluded the observations in the AC Nielsen data that had positive prices but missing quantities of sales.[20]

The data descriptors in the TBS data were not structured in the same way as the product descriptors in the AC Nielsen data. For example, the same product was described as "Stella Artois Lager" and "Stella Artois Premium Lager" in the AC Nielsen data, while it was denoted as "Stella" in the TBS data. Hence, in order to identify the products that are sold in both provinces and those that are not, it was necessary to map the brands from one data set into the brands in the other. I therefore mapped the SKUs in the AC Nielsen data to the brands in the TBS data using brand maps provided to me by TBS. The brands contained within the SKUs from the AC Nielsen data are more disaggregated than the brands in the TBS data. For example, both "Stella Artois Lager" and "Stella Artois Premium Lager" in the AC Nielsen data are mapped to "Stella" in the TBS data. In addition, the mapping between the brands depends on the alcohol percentage contained in the product. For example, "Busch Lager" with 4.7 percent alcohol in the AC Nielsen data is mapped to "Busch Lager" in the TBS data, while "Busch Lager" with 4 percent alcohol in the AC Nielsen data is mapped to "Busch Light" in the TBS data.

Table 2 summarizes the tax structures in each province and depicts the taxes that are included or excluded from each data set. To calculate post-tax prices, I added the federal and relevant provincial sales tax in each province. To conduct a comparison of pre-tax prices, I subtracted the relevant taxes in each province. In Ontario, the provincial commodity tax structure for the products in my analysis includes a $0.7402 per litre basic tax for packaged beer, a $0.176 per litre volume levy, and an environmental levy of $0.0893 per non-refillable container.[21] In Quebec, the provincial commodity tax structure consists of a $0.50 per litre

[17] Other channels in the TBS data include LCBO delivery, agency sales/delivery, and SOP (special event delivery) sales. The Nielsen data include retail sales only.

[18] Some keg, box and pump beer products may be for on-premised consumption purposes. Therefore, I exclude them to analyze off-premise consumption only. I kept Heineken 5L in both provinces.

[19] These observations represent less than 1% of the total litres sold in the AC Nielsen data. The legal minimum price (excluding sales tax) from Jan 1 to March 31, 2013 was $2.7367 and $2.7778 for April 1 to December 31, 2013. I also checked the TBS data against the legal minimum price in Ontario, which is $2.86 (excluding sales tax and environmental levy) and found no instances of TBS prices falling below the legal minimum in Ontario. See http://www.calj.org and www.racj.gouv.qc.ca.

[20] These excluded observations represent approximately 1% of the total observations in the AC Nielsen data.

[21] See http://www.fin.gov.on.ca/en/tax/bwt/rates.html. I deducted the environmental levy only for the products that were identified to me by TBS as having a non-refillable container. The provincial commodity tax was $0.7235 for January and February 2013.

basic tax for retail sales. There are also tax reductions in each province for small brewers; however, I did not adjust for the tax breaks for small brewers in this analysis, due to lack of data allowing me to identify the small brewers to whom the tax reductions would apply and the amount of tax reduction by small brewer which varies in both provinces dependent upon brewers' annual production volume.

I calculated the litres consumed for each product by multiplying the quantity of packs sold, the number of bottles or cans in the pack, and the litres in a single bottle/can. For example, the total litres in 100 units of 341ML-24 packs would be 100*341*24/1000, which is 818.4 litres.

C. Statistical Analysis

I evaluated the post-tax and pre-tax prices of beer in Ontario and Quebec in a number of ways. I performed the comparisons for the volume weighted average prices over all of the beer products sold in each province, as well as examining the volume weighted average prices for only the products that are sold in both provinces (which I term the "overlapping" products). I also studied the non-overlapping products in each province and the best-selling brands in each province.

Table 3 shows my development of the post-tax and pre-tax volume weighted average prices over all products sold in each province. The table also shows the development of the volume weighted average prices in each province broken down into overlapping product only, and non-overlapping products only. Figure 1 shows the results of Table 3 graphically. As shown there, the volume weighted average post-tax per litre prices in Ontario are lower than the volume weighted average post-tax per litre prices in Quebec, when calculated over all products consumed in each province. The overall volume weighted average post-tax price for all of the products is $4.07 in Ontario and $4.15 in Quebec. This is a surprising result because, as noted earlier, the substantially higher taxes in Ontario would be expected, all else equal, to result in higher post-tax prices in Ontario.

In addition, the volume weighted post-tax prices of the products sold in Ontario but not Quebec are lower than the volume weighted post-tax prices of the products sold in Quebec but not Ontario. The volume weighted post-tax prices of the products sold in both provinces are higher in Ontario than in Quebec, though by less than four percent despite the fact that the provincial commodity taxes in Ontario are 200 percent of those in Quebec.

The volume weighted average pre-tax prices in Ontario (i.e., prices with taxes removed) are lower than those in Quebec. This is true for the overall volume weighted average prices, the volume weighted average prices of the overlapping products, and the volume weighted average prices for products sold only in one province or the other. When pre-tax prices are compared, the volume weighted average price in Ontario is $2.28 per litre --- 52 cents per litre lower than the $2.80 per litre volume weighted average pre-tax price of all beer products in Quebec.

Figures 2, 3, 4, 5, 6, and 7 provide similar analysis broken down by package size and container type for the best-selling package configurations. Figure 2 provides the analysis for 6-packs of bottles; Figure 3 for 6-packs of cans; Figure 4 for 12-packs of bottles, Figure 5 for 12-

packs of cans, Figure 6 for 24-packs of bottles, and Figure 7 for 24-packs of cans. As these figures show, the post-tax prices are lower in Ontario for some configurations and higher for others; but overall pre-tax volume weighted average prices in Ontario are lower than those in Quebec for all of the pack sizes shown. The volume weighted average pre-tax prices for the overlapping products are lower in Ontario than in Quebec for all package sizes except 12-pack bottles (where the price difference, six cents, is less than two percent of the price).[22] In addition, the volume weighted average pre-tax prices in Ontario for the Ontario-only products are not only lower than the volume weighted average pre-tax prices for the Quebec-only products overall and for all packages sizes shown, but Figure 1 shows that, on an overall basis, the Quebec-only products are the most expensive segment across both provinces (both on a pre-tax and post-tax basis), while the Ontario-only products are the least expensive segment across both provinces (both on a pre-tax and post-tax basis). Table 4 summarizes the overall pre-tax volume weighted average prices by province shown in the preceding figures by package size, and the dollar and percentage differences between them. As shown, in each case, the pre-tax volume weighted average price is higher in Quebec, by just over three percent for 12-bottle packs, to over 40 percent for 6-can packs. I have provided the development of the numbers in Appendix Tables 1-6.

In both Ontario and Quebec, of course, beer is available at a variety of price levels. Some consumers choose to purchase higher priced beers, and some lower priced beers; indeed one would expect that many consumers purchase a variety of beers at a variety of price points at any given time and over time. To examine how consumers of low-priced beers fare across the provinces, I arrayed all the beer consumed in each province by the prices from lowest to highest, and summed the cumulative volume of beer purchased at each successively higher price. This method also allows me to compare how consumers of mid- and higher-priced beers fare across the provinces as well. Figure 8 shows the cumulative consumption curves that result from the analysis I just described, for both the post-tax and pre-tax prices. The horizontal axis on the chart is the percentage of the total litres of beer purchased in each province. The vertical axis is the price per litre. As an example of how to read the graph, note that the height of the blue dotted curve at the horizontal point of 20 percent is $2.23 per litre. That means in Quebec, 20 percent of all beer purchased, by volume, is purchased at a pre-tax price of $2.23 per litre or less.

As shown in Figure 8, the cumulative consumption curves for Ontario and Quebec for the post-tax prices track each other fairly closely, with post-tax prices in Ontario being somewhat higher over certain consumption ranges, and post-tax prices in Quebec being significantly higher for approximately the 10 percent of volume sold at the highest prices in each province. However, when pre-tax prices are compared, the entire consumption curve for Ontario is below the consumption curve for Quebec. For example, 25 percent of the beer by volume is purchased at a pre-tax price of $1.89 per litre or less in Ontario, while one must reach a pre-tax price of $2.23 per litre to account for 25 percent of the beer purchased in Quebec. Looked at differently, while 25 percent of the beer sold in Ontario is sold at a pre-tax price at or below $1.89 per litre, no beer in Quebec is purchased at or below that price. Similarly, half of the beer is purchased at or below a pre-tax price of $2.13 per litre in Ontario, while half of the beer in Quebec is

[22] See Figure 4.

purchased at or below a pre-tax price of $2.48 per litre. The table inserted in Figure 8 provides the prices at other points on the curves.

Also of interest is the fact that 35 percent of the total litres consumed in Ontario are sold at a pre-tax price lower than the lowest pre-tax price available in Quebec. The lowest pre-tax price available in Quebec is $2.02 per litre.

The volume weighted average prices in Figures 1-7 and the price comparisons I provided in Figure 8 take as given the quantities of different beer products consumed in each province. The volumes of each type of beer and package type chosen by consumers in each province reflect their preferences, of course, but also reflect the fact that the beers carry different relative prices in the two provinces. It is reasonable to assume that consumers adjust their beer purchases across the different brands in response to the relative prices that they face and the beers available to them. To the extent that beer prices reflect the underlying quality of the product, a lower volume weighted average price in one province might therefore reflect consumer preference in respect of price and product quality.

To assess whether potential substitution to lower quality products is driving these inter-provincial price differences (and assuming that lower priced products are actually of lower quality), we employ a standard method by which economists control for the fact that the average prices paid by consumers are influenced by the choices they make among products of different prices and qualities. The method is known as constructing a "price index." In a price index, one compares the average prices in the two groups (in this case, in Ontario and Quebec) holding constant the volume of products (i.e., the product mix) purchased across the two groups, and examines whether one group would pay more, or less, if they continued to consume the same products in the same volumes but did so at the prices available to the other group.

To apply this methodology, I limit the analysis to only those beer products (i.e., brands by package size, container type, and container volume) that are sold in both provinces. I calculated the volume weighted average price of those products at the prices in Ontario, where the weights are the volume of purchases for each product in Ontario. I then calculated the volume weighted average price for those same products at the prices in Quebec, but with the weights held constant at Ontario consumption. Under this approach, the volume weighted average of Quebec prices represents the average price that consumers in Ontario would pay if they purchased the same beer as they currently do, in the same quantities, but did so at Quebec prices.

I performed this calculation for the post-tax prices and the pre-tax prices. The results are shown in Table 5. The table shows that the overall volume weighted average post-tax prices for the overlapping products is 24 cents higher per litre in Ontario than in Quebec when quantities are held constant, but the overall volume weighted average pre-tax prices are 21 cents per litre lower in Ontario than in Quebec when quantities are held constant. Hence, when beer quantities and qualities are held constant between the two provinces, volume weighted average pre-tax price is still lower in Ontario than in Quebec. This indicates that quality

differences between consumption sets in the two provinces are not drivers of the higher pre-tax prices in Quebec. Figure 9 shows the results of Table 5 graphically.

I also considered the possibility that averaging prices across brands may mask important price differences when one confines the analysis to only the best-selling brands. Hence, I also conducted a price comparison on the best-selling brands in each province. I first identified the top ten best-selling brands in each province by volume sold across all package sizes. Table 6a shows the top ten brands in Ontario, the percentage volume of total sales in Ontario accounted for by each brand, and the volume weighted average price of the brand in each province, both pre-tax and post-tax. Table 6b shows the analogous information for the top ten brands sold in Quebec. Looking at both Tables 6a and 6b, the tables show that six brands—Coors Light, Budweiser, Blue, Bud Light, Heineken, and Corona, are in the top ten in both provinces. The number one best-selling brand in both provinces --- Coors Light --- was sold at the same volume weighted average pre-tax price of $2.32 per litre in both provinces. Of the other five brands that are top-ten sellers in both Ontario and Quebec, only one—Bud Light—was sold at a pre-tax price one cent lower in Quebec than in Ontario. The tables also show that one of the top ten brands in Ontario—Lakeport Pilsner—sells at a lower pre-tax price by far than any of the top ten brands in Quebec, but is not sold in Quebec at all.

Table 6a shows that other than Coors Light (sold at the same pre-tax price in both provinces), Lakeport Pilsner (not sold in Quebec), and Bud Light (whose pre-tax price is one cent—or less than one percent—lower in Quebec than in Ontario), the other seven top selling brands in Ontario are sold at a lower pre-tax price in Ontario, with the differences ranging from 4 cents per litre lower for Heineken to 58 cents per litre lower for Blue. In fact, Blue (the fourth best seller in Ontario) and Carling (the sixth best seller in Ontario) are both less expensive in Ontario than in Quebec even including all taxes.

For the best-selling brands in Quebec, Table 6b shows that Molson Dry and Export, which are not in the top 10 in Ontario, are nevertheless sold at lower pre-tax prices in Ontario. Other than Bud Light, mentioned above, the only brand among the top 10 in Quebec that sells at a lower pre-tax price in Quebec than in Ontario is Stella, which is 15 cents per litre cheaper in Quebec. Labatt Bleue Dry Lager is the number 10 brand in Quebec but is not sold in Ontario at all and is more expensive on a pre-tax basis than most of the top beers in Ontario.

Table 7 shows the volume weighted average pre-tax prices for the best-selling brands in each province, allowing for the best-selling brands in each province to differ. I compared the prices for the top three brands, the top five brands, and the top ten brands in each province. As the table shows, the volume weighted average pre-tax prices per litre are lower in Ontario than in Quebec in every case.

The table also shows that consumption is less concentrated in the best-selling brands in Ontario compared to in Quebec. As the table indicates, 30 percent of total consumption of beer in Ontario by volume is accounted for by the top three brands; in Quebec, its top three brands account for 44 percent of its consumption. Similarly, for the top five and top ten brands, beer consumption is less concentrated in Ontario as compared to Quebec. In fact, the best-selling

brand in both provinces --- Coors Light --- represents 23 percent of the beer consumption in Quebec, but 13 percent in Ontario. The fact that consumption is less concentrated in Ontario suggests that the major brands face significant levels of competition from other brands and that consumers in Ontario value the additional variety of beer available in Ontario and take advantage of it by diversifying their consumption more than do consumers in Quebec.

III Concluding Remarks

I have examined and compared both the post-tax and pre-tax prices for beer in Ontario and Quebec in a variety of ways. The overall picture that emerges is very clear: while some post-tax beer prices in Ontario are higher than those in Quebec, many post-tax Ontario prices are lower than those in Quebec, with the net result that Ontario post-tax average price is actually lower than Quebec's despite Ontario prices bearing a significantly higher tax load. When pre-tax beer prices in Ontario are compared to pre-tax prices in Quebec, a more dramatic difference in prices emerges. Ontario's pre-tax prices are consistently lower than pre-tax beer prices in Quebec both on an overall average basis and for the best-selling brands and package sizes. This is true if I control for overlapping products only, if I consider all products purchased, and if I consider products available only in one province or the other. In addition, I find that consumers in Ontario appear to value and enjoy the diversity of beer offerings in that province as evidenced by their consumption patterns.

Table 1: Total Number of Brands/Products

TBS Data and AC Nielsen Data

	TBS	AC Nielsen
Number of Beer Brands	**403**	**878**
Number of Beer Products	**1,619**	**1,487**

Notes:

1. The brands in AC Nielsen data are more disaggregated than the brands in TBS data. For example, AC Nielsen brands "GUINNESS DRAUGHT", "GUINNESS DRAUGHT STOUT" and "GUINNESS STOUT" match to one TBS brand "GUIN DRFT."
2. I define a “product” as a combination of brand, number of containers in the package, container type, and container volume.
3. Bottles and cans are included in this analysis.
4. There are 282 overlapping products in both provinces.

Table 2: Tax Structures in Ontario and Quebec

TBS Data and AC Nielsen Data

	Ontario		Quebec	
	Included in the TBS data?	Rate	Included in the AC Nielsen data?	Rate
Federal Sales Tax	No	5%	No	5%
Provincial Sales Tax	No	8%	No	9.975%
Federal Excise Tax	Yes	$0.3122/litre	Yes	$0.3122/litre
Provincial Basic Commodity Tax	Yes	$0.7402/litre	Yes	$0.5/litre
Provincial Volume Levy	Yes	$0.176/litre	N/A	None
Provincial Environmental Levy	Yes	$0.0893 per non-refillable container	N/A	None

Table 3: Weighted Average Price Per Litre by Province

TBS Data and AC Nielsen Data

		Total Revenue Including All Taxes	Total Litres	Weighted Average Price per Litre	Weighted Average Price per Litre Excluding Sales Taxes	Weighted Average Price per Litre Excluding Sales Taxes and Commodity Taxes	Weighted Average Price per Litre Excluding Sales Taxes, Commodity Taxes and Federal Excise Tax
Beer Products in **Ontario**	[A]	$1,758,146,690	432,034,904	**$4.07**	**$3.60**	**$2.59**	**$2.28**
Overlapping Beer Products	[B]	$880,814,237	210,085,456	**$4.19**	**$3.71**	**$2.72**	**$2.40**
Percent Captured by Overlapping Products	[C]=[B]/[A]	50%	49%				
Ontario-Only Products	[D]	$877,332,453	221,949,447	**$3.95**	**$3.50**	**$2.47**	**$2.16**
Beer Products in **Quebec**	[A]	$725,261,894	174,646,131	**$4.15**	**$3.61**	**$3.11**	**$2.80**
Overlapping Beer Products	[B]	$533,563,944	131,967,018	**$4.04**	**$3.52**	**$3.02**	**$2.70**
Percent Captured by Overlapping Products	[C]=[B]/[A]	74%	76%				
Quebec-Only Products	[D]	$191,697,950	42,679,113	**$4.49**	**$3.91**	**$3.41**	**$3.09**

Figure 1: Weighted Average Price Per Litre by Province

TBS Data and AC Nielsen Data

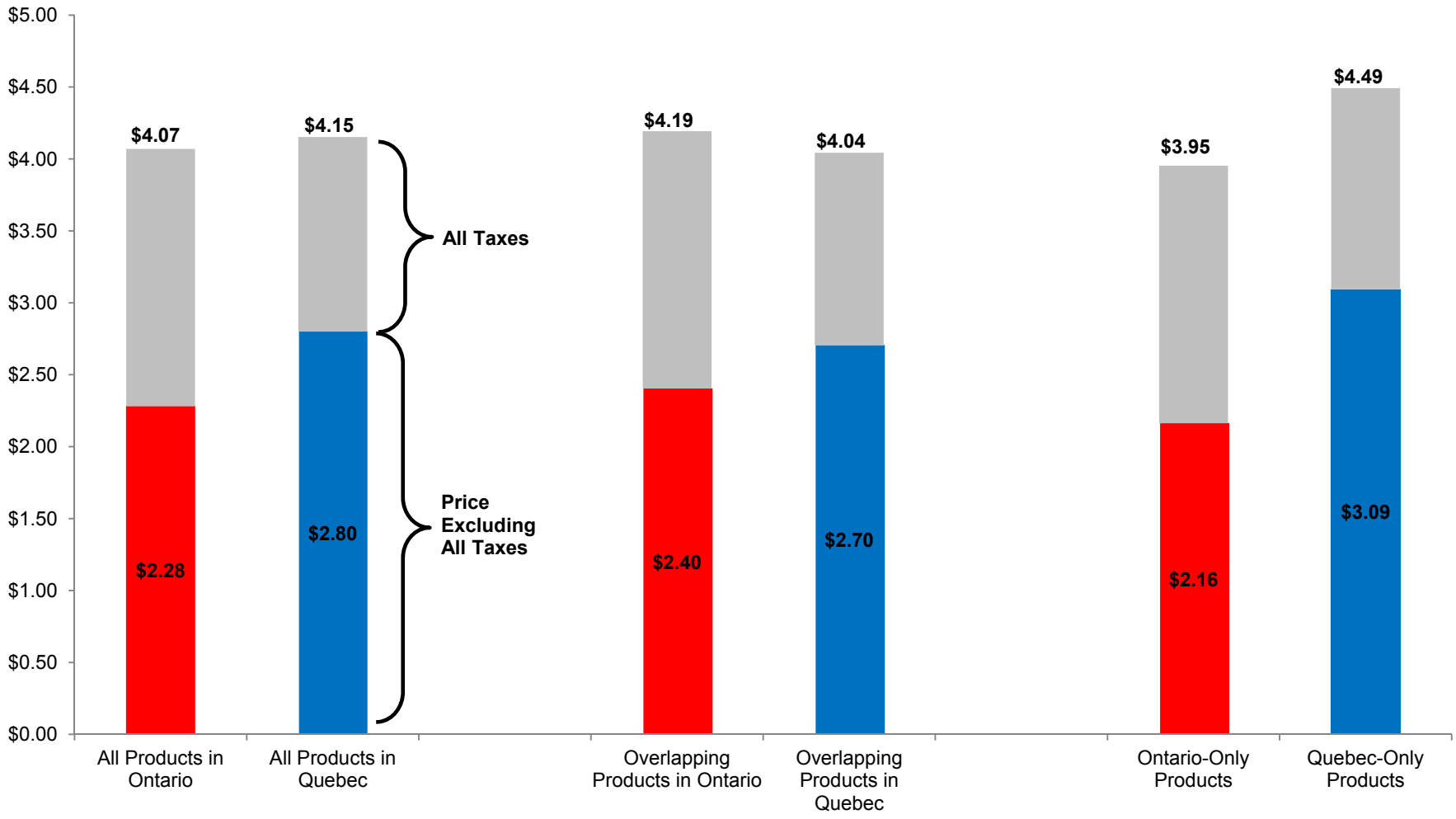


Figure 2: Weighted Average Price Per Litre by Province

6 Pack Bottles, TBS Data and AC Nielsen Data

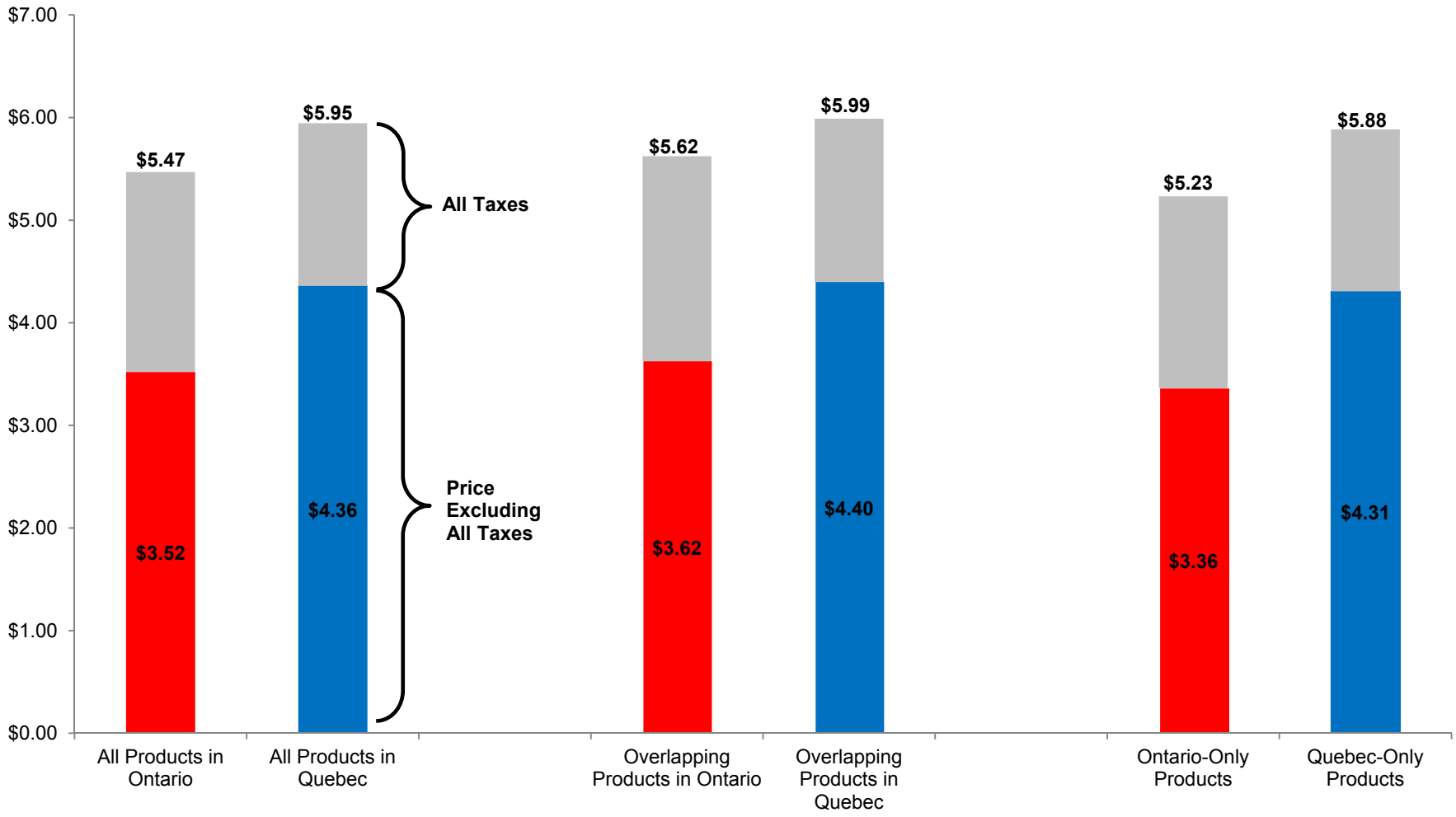


Figure 3: Weighted Average Price Per Litre by Province

6 Pack Cans, TBS Data and AC Nielsen Data

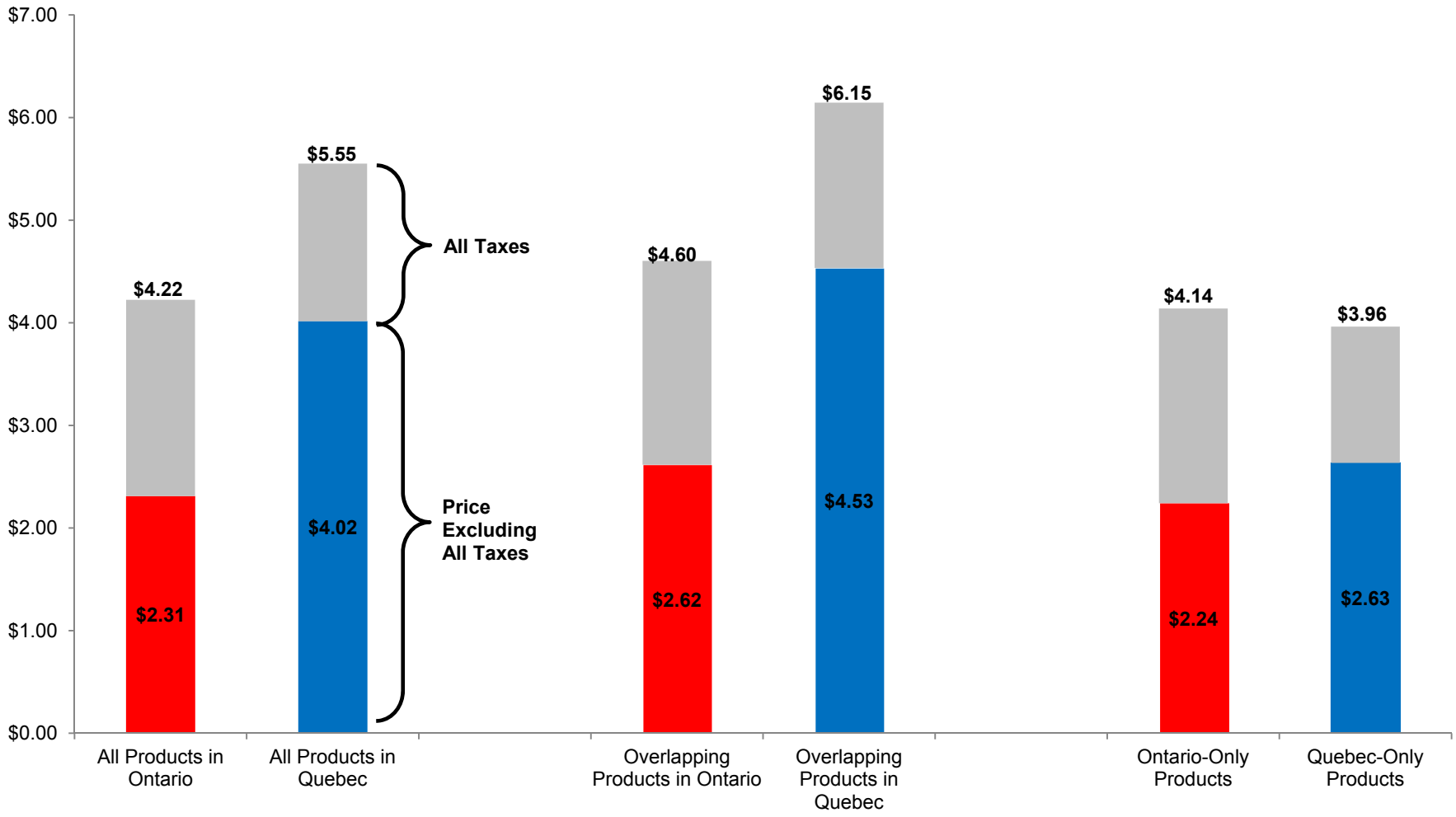


Figure 4: Weighted Average Price Per Litre by Province

12 Pack Bottles, TBS Data and AC Nielsen Data

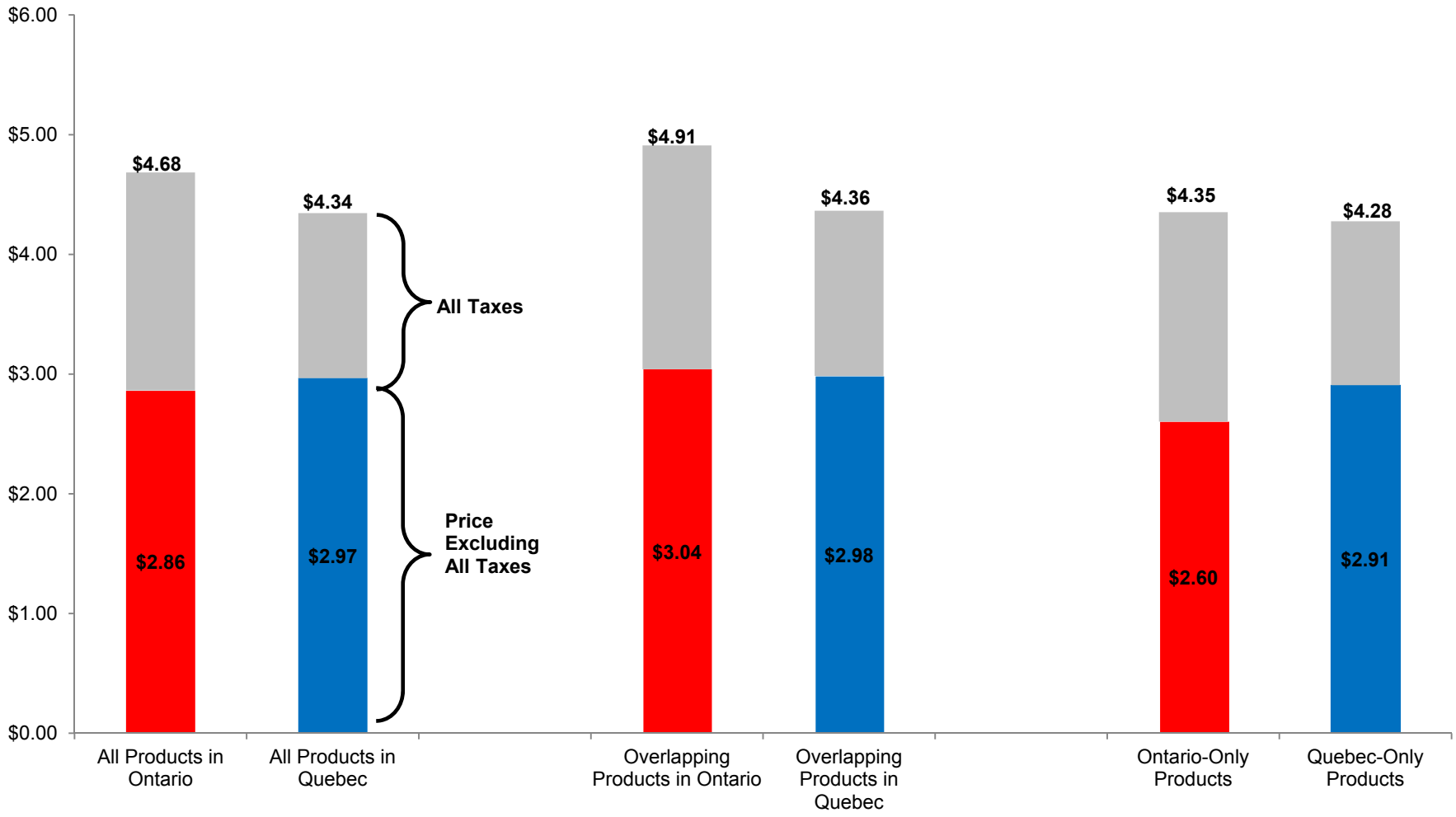


Figure 5: Weighted Average Price Per Litre by Province

12 Pack Cans, TBS Data and AC Nielsen Data

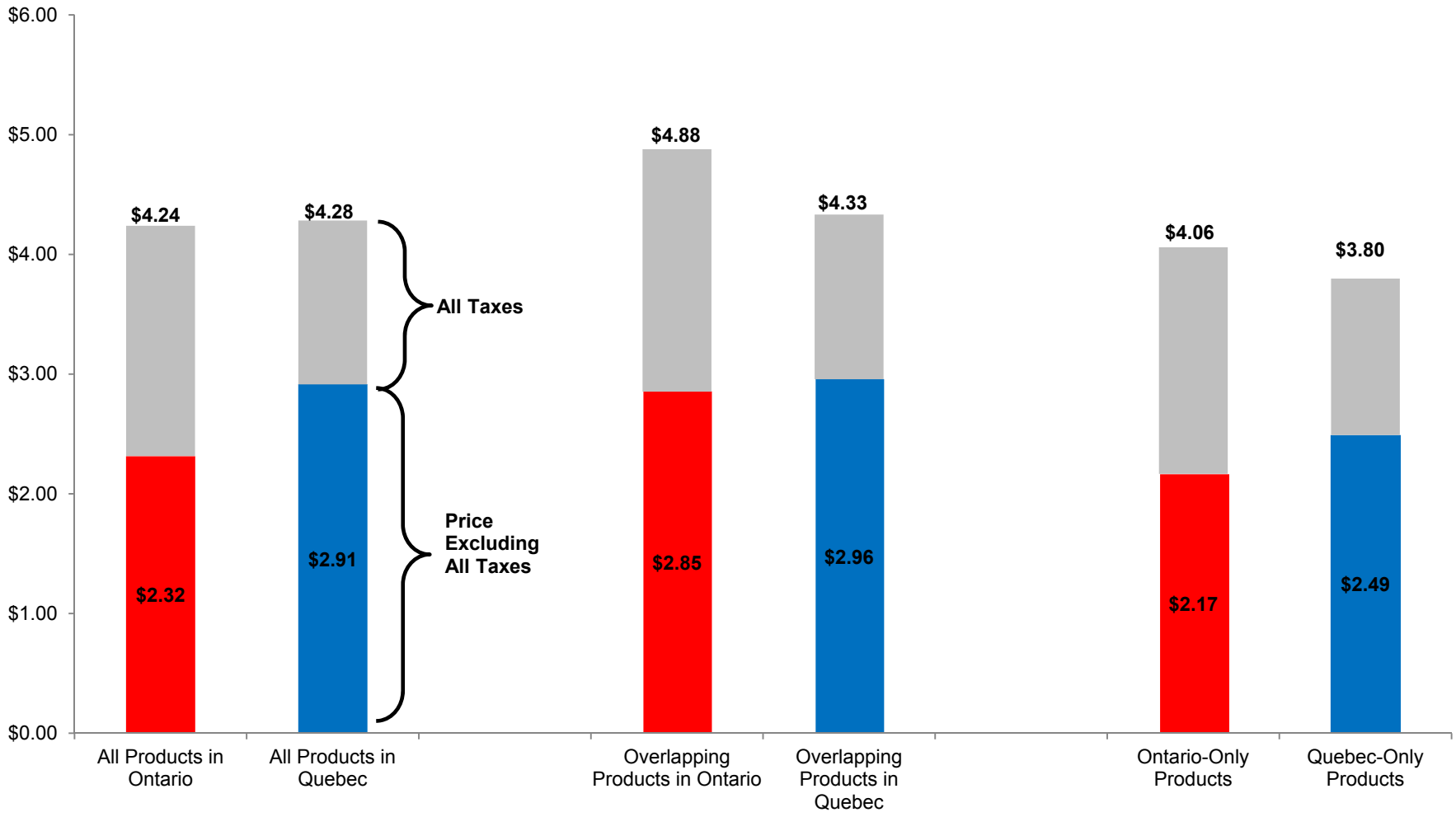


Figure 6: Weighted Average Price Per Litre by Province

24 Pack Bottles, TBS Data and AC Nielsen Data

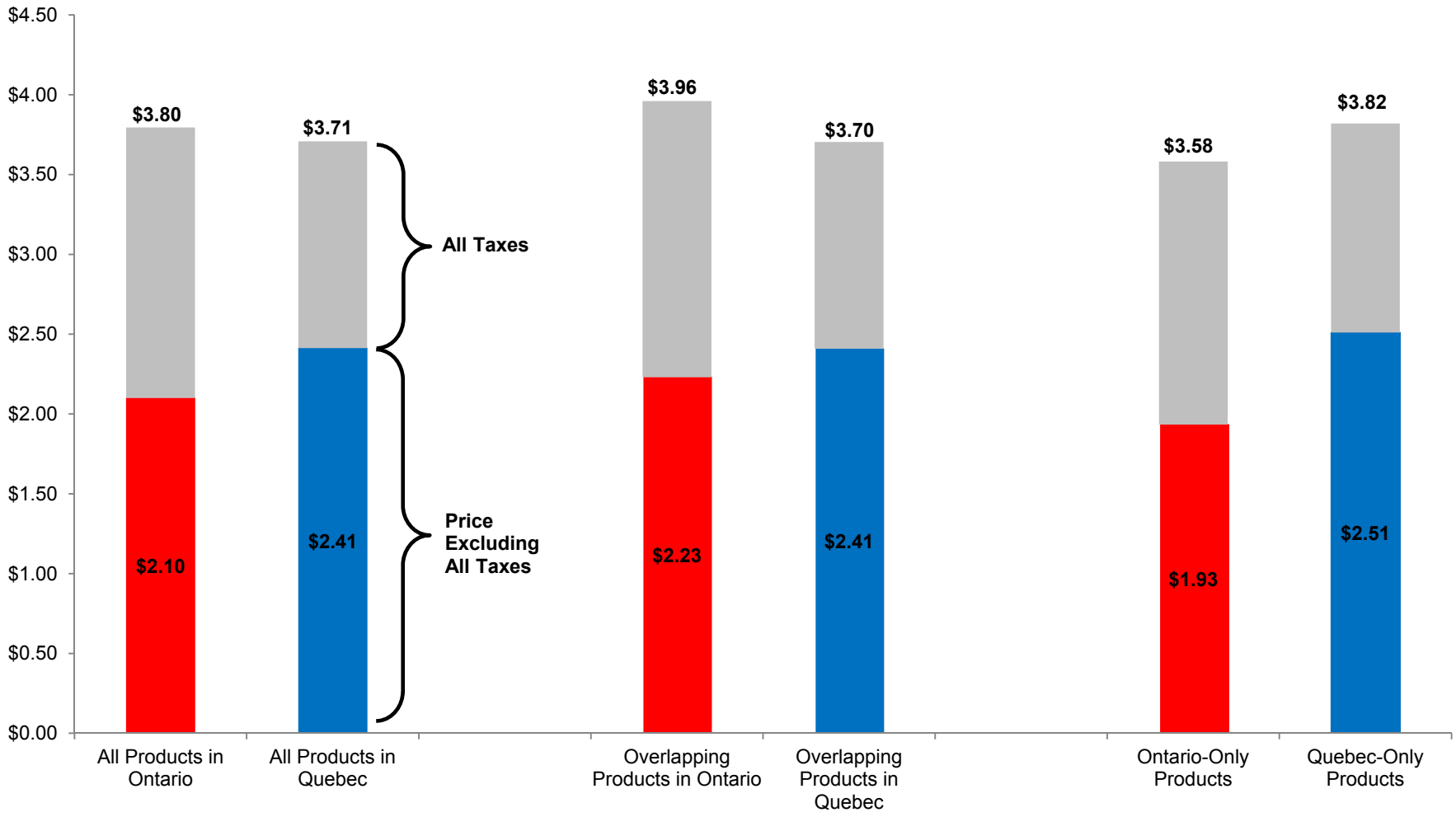


Figure 7: Weighted Average Price Per Litre by Province

24 Pack Cans, TBS Data and AC Nielsen Data

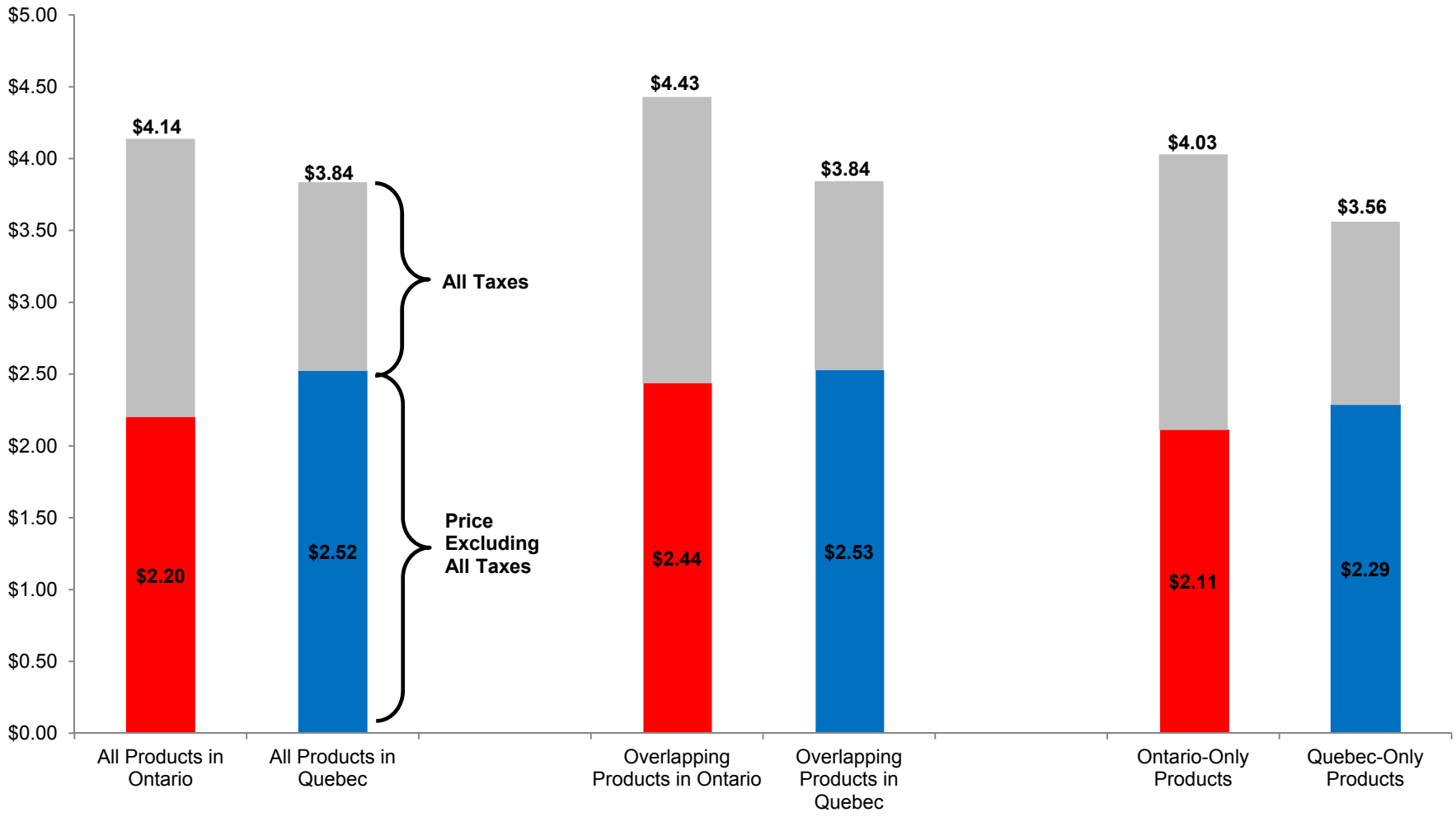


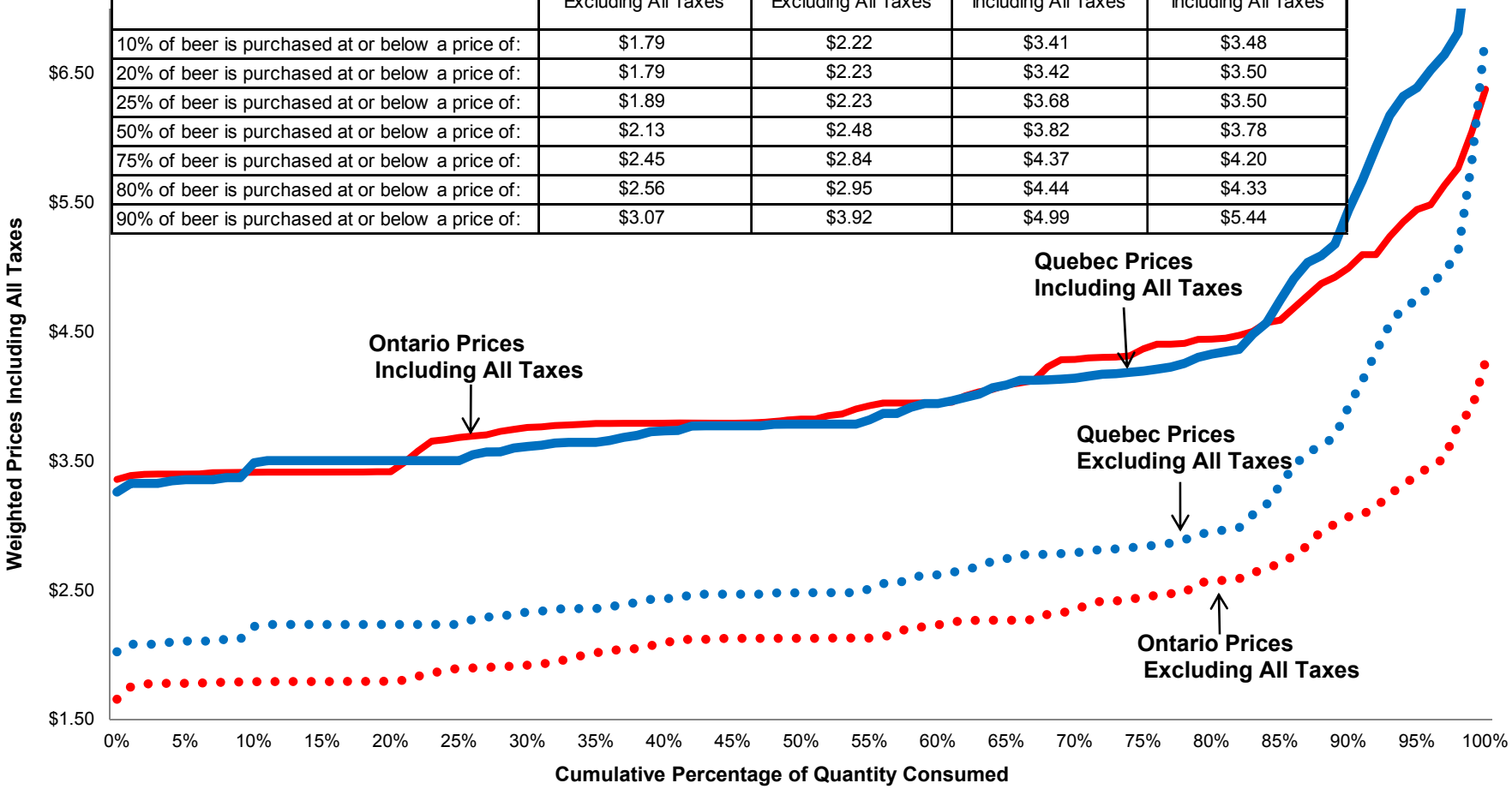
Table 4: Summary of Prices Per Litre By Package Size

Excluding Taxes, TBS Data and AC Nielsen Data

Package Size	Ontario	Quebec	Difference ($)	Difference (%)
	[A]	[B]	[C]=[B]-[A]	[D]=[C]/[B]
6 Bottles	$3.52	$4.36	$0.84	19.2%
6 Cans	$2.31	$4.02	$1.71	42.5%
12 Bottles	$2.86	$2.97	$0.10	3.5%
12 Cans	$2.32	$2.91	$0.60	20.5%
24 Bottles	$2.10	$2.41	$0.31	13.0%
24 Cans	$2.20	$2.52	$0.32	12.8%
All Beers	**$2.28**	**$2.80**	**$0.52**	**18.6%**

Figure 8: Cumulative Percentage of Quantity Consumed at Various Prices
for All Products

	Ontario Price Per Litre Excluding All Taxes	Quebec Price Per Litre Excluding All Taxes	Ontario Price Per Litre Including All Taxes	Quebec Price Per Litre Including All Taxes
10% of beer is purchased at or below a price of:	$1.79	$2.22	$3.41	$3.48
20% of beer is purchased at or below a price of:	$1.79	$2.23	$3.42	$3.50
25% of beer is purchased at or below a price of:	$1.89	$2.23	$3.68	$3.50
50% of beer is purchased at or below a price of:	$2.13	$2.48	$3.82	$3.78
75% of beer is purchased at or below a price of:	$2.45	$2.84	$4.37	$4.20
80% of beer is purchased at or below a price of:	$2.56	$2.95	$4.44	$4.33
90% of beer is purchased at or below a price of:	$3.07	$3.92	$4.99	$5.44



Notes:

1. Thirty-five percent of the total litres of beer sales sold at TBS were sold at a pre-tax price that was lower than the lowest pre-tax price observed in the province of Quebec, which is $2.02.

Table 5: Weighted Price Per Litre for Overlapping Products

Using Ontario Quantities for Both Provinces

		Quebec	Ontario
Including All Taxes	[A]	$3.95	$4.19
Excluding Sales Tax	[B]	$3.44	$3.71
Excluding Sales Tax and Commodity Tax	[C]	$2.94	$2.72
Excluding Sales Tax, Commodity Tax and Federal Excise Tax	[D]	$2.63	$2.40

Net of taxes, Ontarians pay less for overlapping products than consumers in Quebec.
Product mix differences are not driving overall price difference between provinces.

Notes:

1. Price indices for Ontario and Quebec are calculated for both provinces using quantities from TBS data for Ontario. For this analysis, we analyzed only the products that appear in both TBS and AC Nielsen data. To calculate the price index for Ontario, we multiplied the price of each product in Ontario per litre by the volume in litres of that product in Ontario, added those up, and divided by the total volume in litres in Ontario. For Quebec, we multiplied the price of each product in Quebec per litre by the volume of that product in litres in Ontario, added those up, and divided by the total volume in litres in Ontario.
In other words, weighted price in Quebec=sum(P_Quebec*Q_Ontario)/sum(Q_Ontario) and weighted price in Ontario=sum(P_Ontario*Q_Ontario)/sum(Q_Ontario).
2. [B]=[A]/1.13 for Ontario; [B]=[A]/1.14975 for Quebec.
3. [C]=[B]-$0.74/litre - $0.176/litre -$0.0893/non-refillable container for Ontario; [C]=[B]-$0.5/litre for Quebec.
4. [D]=[C] - $0.3122.
5. There are 282 overlapping products in both provinces.

Figure 9: Price Per Litre for Total Litres Consumed By Province

for Overlapping Products

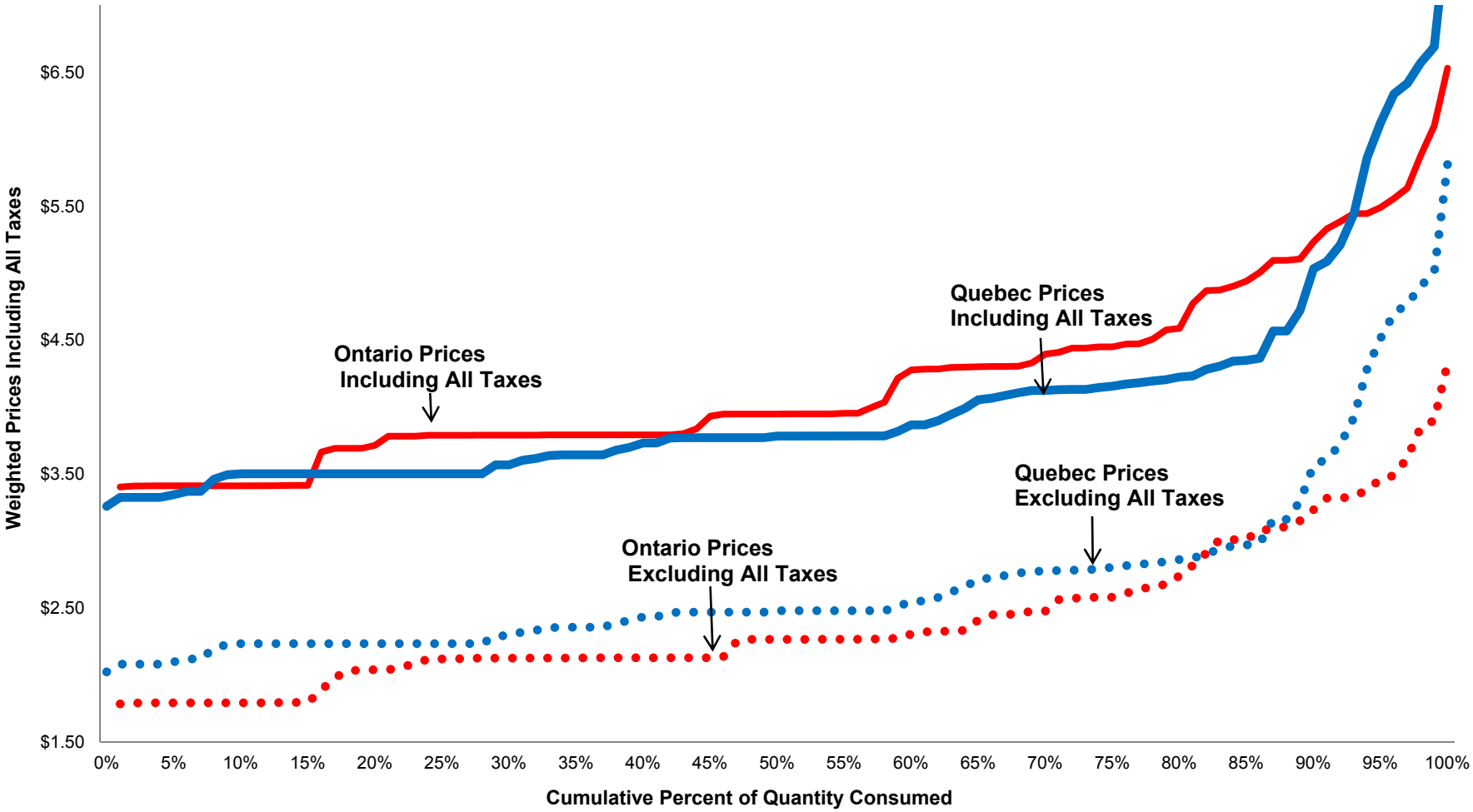


Table 6a: Weighted Average Price Per Litre For The Top Ten Best-Selling Brands by Volume Sold in Ontario

TBS Data and AC Nielsen Data

		Ontario Price Per Litre Including All Taxes	Ontario Price Per Litre Excluding All Taxes	Percentage of Consumption in Ontario	Quebec Price Per Litre Including All Taxes	Quebec Price Per Litre Excluding All Taxes
1	COORS LIGHT	$4.09	$2.32	13%	$3.60	$2.32
2	CANADIAN	$4.10	$2.32	9%	$4.01	$2.68
3	BUDWEISER	$4.11	$2.33	8%	$3.90	$2.58
4	BLUE	$3.61	$1.92	7%	$3.80	$2.50
5	BUD LIGHT	$4.10	$2.31	5%	$3.58	$2.30
6	CARLING	$3.58	$1.87	5%	$3.62	$2.34
7	BUSCH LAGER	$3.71	$1.89	3%	$3.57	$2.29
8	LAKEPORT PILSNER	$3.59	$1.88	2%	N/A	N/A
9	HEINEKEN	$5.49	$3.38	2%	$4.86	$3.42
10	CORONA	$5.27	$3.16	2%	$4.73	$3.30

Table 6b: Weighted Average Price Per Litre For The Top Ten Best-Selling Brands by Volume Sold in Quebec

TBS Data and AC Nielsen Data

		Quebec Price Per Litre Including All Taxes	Quebec Price Per Litre Excluding All Taxes	Percentage of Consumption in Quebec	Ontario Price Per Litre Including All Taxes	Ontario Price Per Litre Excluding All Taxes
1	COORS LIGHT	$3.60	$2.32	23%	$4.09	$2.32
2	BUDWEISER	$3.90	$2.58	14%	$4.11	$2.33
3	BUD LIGHT	$3.58	$2.30	7%	$4.10	$2.31
4	MOLS DRY	$3.93	$2.61	6%	$3.96	$2.19
5	BLUE	$3.80	$2.50	5%	$3.61	$1.92
6	HEINEKEN	$4.86	$3.42	4%	$5.49	$3.38
7	EXPORT	$3.95	$2.62	4%	$4.13	$2.39
8	CORONA	$4.73	$3.30	3%	$5.27	$3.16
9	STELLA	$4.79	$3.36	2%	$5.64	$3.51
10	LABATT BLEUE DRY LAGER	$3.92	$2.59	1%	N/A	N/A

Table 7: Weighted Average Price Per Litre for the Best-Selling Brands

Excluding All Taxes, TBS Data and AC Nielsen Data

	Ontario	Quebec
Top 3 Brands With the Highest Litres Consumed in Each Province	$2.32	$2.40
Percent of Litres Captured by the Top 3 Brands	**30%**	**44%**
Top 5 Brands With the Highest Litres Consumed in Each Province	$2.26	$2.43
Percent of Litres Captured by the Top 5 Brands	**42%**	**54%**
Top 10 Brands With the Highest Litres Consumed in Each Province	$2.26	$2.57
Percent of Litres Captured by the Top 10 Brands	**56%**	**69%**

Appendix Table 1: Weighted Average Price Per Litre by Province

6 Pack Bottles, TBS Data and AC Nielsen Data

		Total Revenue Including All Taxes	Total Litres	Weighted Average Price per Litre	Weighted Average Price per Litre Excluding Sales Taxes	Weighted Average Price per Litre Excluding Sales Taxes and Commodity Taxes	Weighted Average Price per Litre Excluding Sales Taxes, Commodity Taxes and Federal Excise Tax
6 Pack Bottled Beer Products in **Ontario**	[A]	$45,105,110	8,247,463	**$5.47**	**$4.84**	**$3.83**	**$3.52**
Overlapping Beer Products	[B]	$28,070,307	4,991,586	**$5.62**	**$4.98**	**$3.94**	**$3.62**
Percent Captured by Overlapping Products	[C]=[B]/[A]	62%	61%				
Ontario-Only Products	[D]	$17,034,804	3,255,877	**$5.23**	**$4.63**	**$3.67**	**$3.36**
6 Pack Bottled Beer Products in **Quebec**	[A]	$60,200,408	10,126,168	**$5.95**	**$5.17**	**$4.67**	**$4.36**
Overlapping Beer Products	[B]	$35,512,321	5,930,723	**$5.99**	**$5.21**	**$4.71**	**$4.40**
Percent Captured by Overlapping Products	[C]=[B]/[A]	59%	59%				
Quebec-Only Products	[D]	$24,688,087	4,195,445	**$5.88**	**$5.12**	**$4.62**	**$4.31**

Appendix Table 2: Weighted Average Price Per Litre by Province

6 Pack Cans, TBS Data and AC Nielsen Data

		Total Revenue Including All Taxes	Total Litres	Weighted Average Price per Litre	Weighted Average Price per Litre Excluding Sales Taxes	Weighted Average Price per Litre Excluding Sales Taxes and Commodity Taxes	Weighted Average Price per Litre Excluding Sales Taxes, Commodity Taxes and Federal Excise Tax
6 Pack Canned Beer Products in **Ontario**	[A]	$65,185,923	15,432,501	**$4.22**	**$3.74**	**$2.62**	**$2.31**
Overlapping Beer Products	[B]	$13,061,714	2,837,388	**$4.60**	**$4.07**	**$2.93**	**$2.62**
Percent Captured by Overlapping Products	[C]=[B]/[A]	20%	18%				
Ontario-Only Products	[D]	$52,124,209	12,595,114	**$4.14**	**$3.66**	**$2.55**	**$2.24**
6 Pack Canned Beer Products in **Quebec**	[A]	$11,905,502	2,144,595	**$5.55**	**$4.83**	**$4.33**	**$4.02**
Overlapping Beer Products	[B]	$9,590,685	1,560,504	**$6.15**	**$5.35**	**$4.85**	**$4.53**
Percent Captured by Overlapping Products	[C]=[B]/[A]	81%	73%				
Quebec-Only Products	[D]	$2,314,817	584,091	**$3.96**	**$3.45**	**$2.95**	**$2.63**

Appendix Table 3: Weighted Average Price Per Litre by Province

12 Pack Bottles, TBS Data and AC Nielsen Data

		Total Revenue Including All Taxes	Total Litres	Weighted Average Price per Litre	Weighted Average Price per Litre Excluding Sales Taxes	Weighted Average Price per Litre Excluding Sales Taxes and Commodity Taxes	Weighted Average Price per Litre Excluding Sales Taxes, Commodity Taxes and Federal Excise Tax
12 Pack Bottled Beer Products in **Ontario**	[A]	$156,866,194	33,485,803	**$4.68**	**$4.15**	**$3.18**	**$2.86**
Overlapping Beer Products	[B]	$97,977,596	19,955,762	**$4.91**	**$4.34**	**$3.35**	**$3.04**
Percent Captured by Overlapping Products	[C]=[B]/[A]	62%	60%				
Ontario-Only Products	[D]	$58,888,598	13,530,040	**$4.35**	**$3.85**	**$2.92**	**$2.60**
12 Pack Bottled Beer Products in **Quebec**	[A]	$123,505,398	28,427,440	**$4.34**	**$3.78**	**$3.28**	**$2.97**
Overlapping Beer Products	[B]	$96,036,280	22,003,734	**$4.36**	**$3.80**	**$3.30**	**$2.98**
Percent Captured by Overlapping Products	[C]=[B]/[A]	78%	77%				
Quebec-Only Products	[D]	$27,469,118	6,423,706	**$4.28**	**$3.72**	**$3.22**	**$2.91**

Appendix Table 4: Weighted Average Price Per Litre by Province

12 Pack Cans, TBS Data and AC Nielsen Data

		Total Revenue Including All Taxes	Total Litres	Weighted Average Price per Litre	Weighted Average Price per Litre Excluding Sales Taxes	Weighted Average Price per Litre Excluding Sales Taxes and Commodity Taxes	Weighted Average Price per Litre Excluding Sales Taxes, Commodity Taxes and Federal Excise Tax
12 Pack Canned Beer Products in **Ontario**	[A]	$111,014,053	26,188,873	**$4.24**	**$3.75**	**$2.63**	**$2.32**
Overlapping Beer Products	[B]	$28,044,759	5,748,350	**$4.88**	**$4.32**	**$3.17**	**$2.85**
Percent Captured by Overlapping Products	[C]=[B]/[A]	25%	22%				
Ontario-Only Products	[D]	$82,969,295	20,440,523	**$4.06**	**$3.59**	**$2.48**	**$2.17**
12 Pack Canned Beer Products in **Quebec**	[A]	$30,854,503	7,203,114	**$4.28**	**$3.73**	**$3.23**	**$2.91**
Overlapping Beer Products	[B]	$28,329,505	6,538,216	**$4.33**	**$3.77**	**$3.27**	**$2.96**
Percent Captured by Overlapping Products	[C]=[B]/[A]	92%	91%				
Quebec-Only Products	[D]	$2,524,999	664,898	**$3.80**	**$3.30**	**$2.80**	**$2.49**

Appendix Table 5: Weighted Average Price Per Litre by Province

24 Pack Bottles, TBS Data and AC Nielsen Data

		Total Revenue Including All Taxes	Total Litres	Weighted Average Price per Litre	Weighted Average Price per Litre Excluding Sales Taxes	Weighted Average Price per Litre Excluding Sales Taxes and Commodity Taxes	Weighted Average Price per Litre Excluding Sales Taxes, Commodity Taxes and Federal Excise Tax
24 Pack Bottled Beer Products in **Ontario**	[A]	$576,686,590	151,958,670	**$3.80**	**$3.36**	**$2.41**	**$2.10**
Overlapping Beer Products	[B]	$338,891,344	85,564,095	**$3.96**	**$3.51**	**$2.54**	**$2.23**
Percent Captured by Overlapping Products	[C]=[B]/[A]	59%	56%				
Ontario-Only Products	[D]	$237,795,246	66,394,575	**$3.58**	**$3.17**	**$2.25**	**$1.93**
24 Pack Bottled Beer Products in **Quebec**	[A]	$258,462,522	69,700,231	**$3.71**	**$3.23**	**$2.73**	**$2.41**
Overlapping Beer Products	[B]	$249,007,405	67,225,131	**$3.70**	**$3.22**	**$2.72**	**$2.41**
Percent Captured by Overlapping Products	[C]=[B]/[A]	96%	96%				
Quebec-Only Products	[D]	$9,455,116	2,475,100	**$3.82**	**$3.32**	**$2.82**	**$2.51**

Appendix Table 6: Weighted Average Price Per Litre by Province

24 Pack Cans, TBS Data and AC Nielsen Data

		Total Revenue Including All Taxes	Total Litres	Weighted Average Price per Litre	Weighted Average Price per Litre Excluding Sales Taxes	Weighted Average Price per Litre Excluding Sales Taxes and Commodity Taxes	Weighted Average Price per Litre Excluding Sales Taxes, Commodity Taxes and Federal Excise Tax
24 Pack Canned Beer Products in **Ontario**	[A]	$179,252,999	43,320,240	**$4.14**	**$3.66**	**$2.51**	**$2.20**
Overlapping Beer Products	[B]	$52,217,363	11,789,667	**$4.43**	**$3.92**	**$2.75**	**$2.44**
Percent Captured by Overlapping Products	[C]=[B]/[A]	29%	27%				
Ontario-Only Products	[D]	$127,035,636	31,530,573	**$4.03**	**$3.57**	**$2.42**	**$2.11**
24 Pack Canned Beer Products in **Quebec**	[A]	$20,260,696	5,281,834	**$3.84**	**$3.34**	**$2.84**	**$2.52**
Overlapping Beer Products	[B]	$19,814,502	5,156,535	**$3.84**	**$3.34**	**$2.84**	**$2.53**
Percent Captured by Overlapping Products	[C]=[B]/[A]	98%	98%				
Quebec-Only Products	[D]	$446,194	125,299	**$3.56**	**$3.10**	**$2.60**	**$2.29**