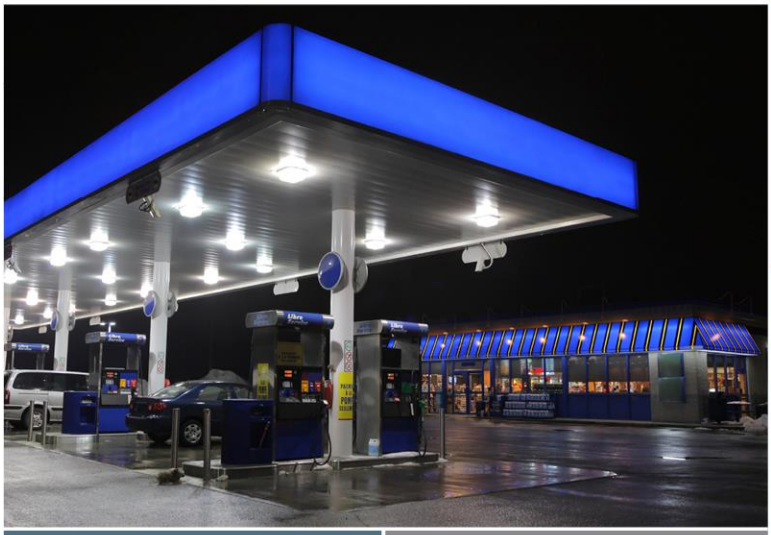

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Unique perspectives on the petroleum industry

Report: Understanding Retail Transportation Fuel Pricing in Ontario

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Ontario

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Executive Summary

The price of transportation fuel has a significant impact on the lives of Ontario consumers. For most people, gasoline or diesel-powered vehicles are their main source of transportation. The average Ontario household owns 1.6 vehicles, spending roughly $3,100 annually on transportation fuels. Its 8 million drivers purchased over 16 billion liters of transportation fuel in 2016, at an average price of $1.00 per litre.

The significance of fuel prices on household budgets has for many years, engendered a sensitivity to changes in the price at the pump, and to any disparities in the price between one market and another. According to a survey conducted by Ipsos Public Affairs as a part of this study, 69 percent of Ontario drivers indicated that the price of fuel had adversely impacted their household finances. Drivers reported a general sensitivity to the price of fuel, with 67 percent of drivers viewing pump prices as unreasonable. Many Ontario drivers surveyed concede that they have limited knowledge of how gasoline prices are set, with half of the drivers surveyed saying they specifically sought information about fuel prices at least “somewhat often.”

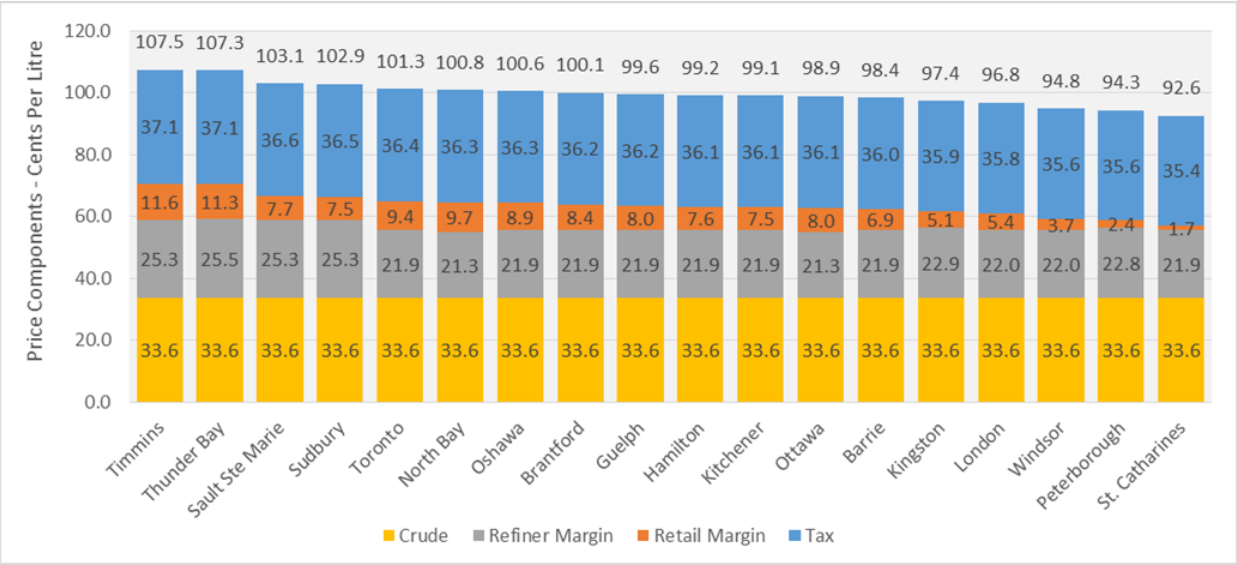
Fifty distinct brands of gasoline are sold in Ontario, although three well-known national brands (Esso, Shell and Petro-Canada) appear on more than half of all gas stations in the province. While this might suggest a concentration of ownership, the displayed brand is not necessarily indicative of who supplies fuel to the site, who owns the site’s assets, or who is responsible for setting the pump price. Over the last twenty years, the responsibility for the retail sale of gasoline has largely shifted away from the owners of these well-known brands, towards fuel marketers that are independent of refining and crude oil operations.

In 2016, only 22 percent of the 3,228 gas stations in Ontario had their prices directly set by “integrated” oil companies (that both refine and market fuels), while 78 percent of Ontario sites had their prices set by local retailers or by a non-refiner marketer. There is generally a higher proportion of retailer-priced sites in smaller markets and in northern Ontario, while in large urban markets pump prices are more often controlled by marketers, rather than retailers.

Pump prices can be best understood as essentially a build-up of four components as illustrated in the figure below. This “value chain” incorporates the price of crude oil; the “gross refining margin” that the refiner adds to its crude purchase price to cover the manufacturing and then selling of wholesale gasoline; the “retail margin” that the marketer adds to the wholesale price to transport fuel and to operate the gas station; and taxes that are levied at the federal and provincial level[1].

[1] See report page 27 for a complete explanation of the relationship between margins and prices.

Ontario Retail Pump Prices and Components – 2016 Average – Regular Grade Gasoline



Pump price trends are mainly a reflection of changes in the underlying wholesale (rack) price that retailers pay for gasoline which in turn, are a reflection of changes in the underlying price of crude oil as well as the volatility of the refiner margin. This volatility is driven by several factors, including seasonality of demand, refinery utilization relative to existing refining capacity, and exchange rates. The wholesale price of gasoline has accounted for 73% of the change in pump prices between 2002 and 2017.

Other market factors which influence prices include inflationary pressures, changes in taxation rates, and changes in the retail margin. For most of the past 25 years, retail margins have averaged between four and seven cents per litre, although in the last few years margins have risen above this historical norm, mainly due to flattened sales volumes, a levelling-off of the revenue growth from non-fuel sales at sites, and a maturation in the influx of fuel price discounters such as Costco.

Historical analysis reveals that while new taxes and costs associated with carbon pricing have increased since 2010, and retail and refining revenues have climbed in recent years, current pump prices are generally lower than they were a decade ago and only 6% greater than they were in 1991, after controlling for inflation.

Pump prices often vary by location: at any given time, they may differ between markets, regions, or provinces. These intermarket price differences are the result of three key differences: in tax rates, in differing wholesale prices arising from varied distance-related transportation costs, and in retail margins.

Prices are also affected by revenue from non-petroleum offerings, which can also effectively subsidize the price at the pump. In addition, competition from other retailers is

a constant factor that influences pump price changes as well as price differences between sites. “Big box” retailers such as Costco tend to offer gasoline at a discount relative to convenience-based gas stations.

While some consumers view pump price volatility as indicative of a lack of competitive behavior, our analysis showed that markets with greater frequency of price changes generally had *lower* retail margins – and generally lower prices for consumers as a result. The correlation between price and volatility was the strongest of all the pricing factors that we examined.

The federal Competition Bureau has oversight of all retail competitiveness in Canada. Some Canadian provinces (Quebec and provinces in Atlantic Canada) regulate transportation fuel prices; Ontario does not. Our analysis demonstrates that regulation can affect fuel prices by altering the competitive dynamics of a market and its prices in ways that may not necessarily benefit consumers. In some provinces, regulations have resulted in prices that were higher (though less volatile) than would likely be experienced in an unregulated setting.

Our analysis of 65 Canadian markets[2] showed that 2016 pump prices in Ontario’s 18 markets reasonably reflected each market’s individual characteristics. We demonstrated that several factors – crude prices, wholesale fuel prices, retail site volume efficiencies, and competition within a given market – had unique effects on each Ontario market we reviewed. When considering these factors, we concluded that in each of the markets we reviewed, that fuel price levels, their volatility, and the inter-market differences that exist, are reasonable and representative of competitive market behavior.

[2]Analysis presented in Section 7 of this report.

Section 1: Introduction

The price of transportation fuel has a significant impact on the lives of Ontario consumers, the majority of whom use gasoline or diesel-powered vehicles as a primary source of transportation. According to recent census data, there were nearly 8 million registered light-duty vehicles in Ontario in 2016, or nearly 1.6 per household. Average reported household spending on fuel totaled roughly $3,100.

Consumers generally feel that fuel prices are affecting their lives.[3] Roughly 40 percent of Ontario drivers claimed that current fuel prices have forced them to drive less often, and 34 percent say that it limited the amount they can spend on other items. These same views are more pronounced for lower-income, elderly, and Northern Ontario residents.

Furthermore, variations in the price of gasoline between geographic regions of Ontario resulted in increased public attention towards fuel prices, and the causes of pump price changes.

Kent Group Ltd has been retained by the Ontario Energy Board (OEB) to develop a report on retail transportation fuels prices, at the request of Ontario's Minister of Energy. The Ministry's own data on the variation of pump prices across the province, and the related public attention on the matter of fuel prices, were the general rationale for the commissioning of this report.

Our specific mandate, which is described in a Request for Proposals issued by the OEB on February 7, 2017, is to provide a detailed examination of:

- Relevant components of retail gasoline and diesel prices;
- The structural elements of the industry, and the market dynamics that determine how transportation fuel prices are set;
- The factors that affect the pricing of transportation fuels, and how that pricing has changed over time;
- The factors that influence price variations between retailers in a market, between markets and regions within Ontario, and between Ontario and other provinces;
- Price regulations in Canada: their structure, aims, and an evaluation of their general effectiveness and influence on pump prices;
- Consumer knowledge and attitudes towards transportation fuel pricing, and an assessment of the price information available to consumers evaluated against their price-seeking behaviour and informational needs.

[3] According to research conducted by Ipsos Public Affairs in support of this report.

The report is structured as follows:

- **Scope and Methods**: this section includes descriptions of the data and resources used, the industry stakeholders that were consulted, and an overview of the consumer research data and consumer outreach conducted.

- **Perceptions, Knowledge, and Public Sources of Information on Transportation Fuel Pricing**: provides an overview of results from the consumer outreach report, discussing specifically the public's knowledge and attitudes towards transportation fuel pricing in Ontario. It also provides a review of public sources and uses of information on transportation fuels pricing, as well as an assessment of consumer informational needs in Ontario.

- **Background: The Structure of the Retail Sector for Transportation Fuel**: provides background, establishing a knowledgebase regarding structural elements of the retail sector to better understand price/margin analysis later in the report, as well as provides some insight into the effect of this structure on pump prices.

- **Understanding Transportation Fuel Price Components**: provides general information about how pump prices are determined, including an overview of the markets that define component prices (costs) and margin elements that ultimately build up to the price at the pump.

- **Trend Analysis - Why Pump Prices Change over Time**: provides an overview of how changes in the markets and components outlined in the previous section can lead to changes in pump prices over time.

- **Market Study - Why Pump Prices Can Differ between Locations**: explains the causes and factors that lead to pump price differences between two markets at any given time. It provides analysis for each specific cause/factor, and offers examples using actual price data for markets within Ontario and in other regions.

- **Overview and Analysis of Price Regulation**: provides an overview of price competition in the fuel sector and the role of the Competition Bureau in Canada, as well as an overview of price regulation in Canada, its objectives, mechanics, and an analysis of regulatory outcomes in each regulated Province.

Terms which may be unfamiliar to the reader, or which have a specific meaning in the context of this report, are detailed in Appendix A.

Unless noted, prices are for regular-grade gasoline. Provincial or national average prices (unless noted) reflect a volume weighted-average[4] of all available markets in

[4]Meaning that the prices or margins are weighted by market based on the total annual demand attributed to each market.

our price data. All prices and margins referred to in this document are stated in nominal Canadian dollars or cents (i.e. not adjusted for inflation, unless noted).

When referring to “retail margins,” this report refers to a “rack-to-retail” margin calculation, which is defined between the market-driven price points of the pump price (tax removed), and the (wholesale) posted rack price.

Section 2: Scope, Methodologies and Resources

The report includes data and information related to transportation fuel pricing itself as well as input from industry stakeholders and results from a survey conducted with consumers of transportation fuels (Ontario drivers).

The scope and methodology of our report includes:

- Comprehensive research and review of external and internal (to Kent) resources and reports available to Kent;
- The engagement of industry stakeholders, including wholesalers, retail marketers, and industry associations; and
- The extraction and analysis of data from Kent's in-house data resources.

The main resources used to support the analysis in this report includes:

- Kent's petroleum price database – this database contains *actual* retail, wholesale, and crude prices, along with calculated taxes and margins for roughly 70 surveyed markets across Canada. This data has, at a minimum, a weekly frequency and is available in most of the 70 markets back to 2001. This is the same dataset that feeds into the price and margin data that is available from Natural Resources Canada.
- Kent's proprietary retail fuel site and sales volume database – this database contains *actual* volumetric sales and outlet profile data collected at roughly 7000 Canadian retail sites in over 300 markets, for more than 40 years. This data is collected on site from retailers, and represents verifiable pump-level sales that are subject to extensive audit by our experienced staff.
- Kent's Canadian Retail Site Census database – this report is an enumeration of the total number of sites in Canada (by province) along with a breakdown of those sites' listed marketers, brands, price-control, and ancillary offerings. The report was first published in 2004, and subsequently in 2005, 2006, 2008, 2010, and then annually from 2012 to 2016.
- Also cited in this report are a number of other Kent datasets, analysis, and report information, as well as public domain datasets from the National Energy Board, and Statistics Canada.

Unless otherwise stated in the report, use of the term "pump price" refers specifically to gasoline.

Stakeholder Engagement

Kent approached a number of industry stakeholders to provide input on issues related to the focus of this report, which included major integrated oil companies, independent fuel marketers, government, and non-governmental industry organizations. Principally, our engagement with industry participants was focused on their views and efforts in providing

information on transportation fuel pricing. In the course of our engagements, we sought participation and received feedback from a number of industry stakeholders:

- The Competition Bureau – Kent's discussions with the Bureau focused on defining their specific role in the regulation of competitive markets, a profile of the frequency and type of consumer complaints, and the general actions taken by the Bureau in response to those complaints.

- The Canadian Fuels Association (CFA) – Kent's discussions with the CFA focused on their work in communicating, on behalf of their members (primarily refiners and integrated-marketers), information about petroleum fuels, petroleum markets and price-related dynamics to the public, industry, and government.

- The Canadian Independent Petroleum Marketers Association (CIPMA) - Kent's discussions with CIPMA focused on their work in communicating, on behalf of their members (primarily independent fuel marketers and suppliers), information about petroleum industry trends, regulatory trends, as well as petroleum market and price-related dynamics to the public, industry, and government.

- Industry Participants – Kent conducted discussions with a variety of fuels marketers representing a geographic and organizational cross-section of the industry. These discussions focused primarily on communications with the public and government pertaining to price-related issues.

Consumer Engagement Outreach

The OEB commissioned Ipsos Public Affairs (Ipsos) to conduct a consumer survey on transportation fuel pricing to understand customers' attitudes, opinions, and knowledge about transportation fuel prices. Those findings are incorporated into this report. The survey focused on four key topics as they pertain to customer views and interest in transportation fuel pricing:

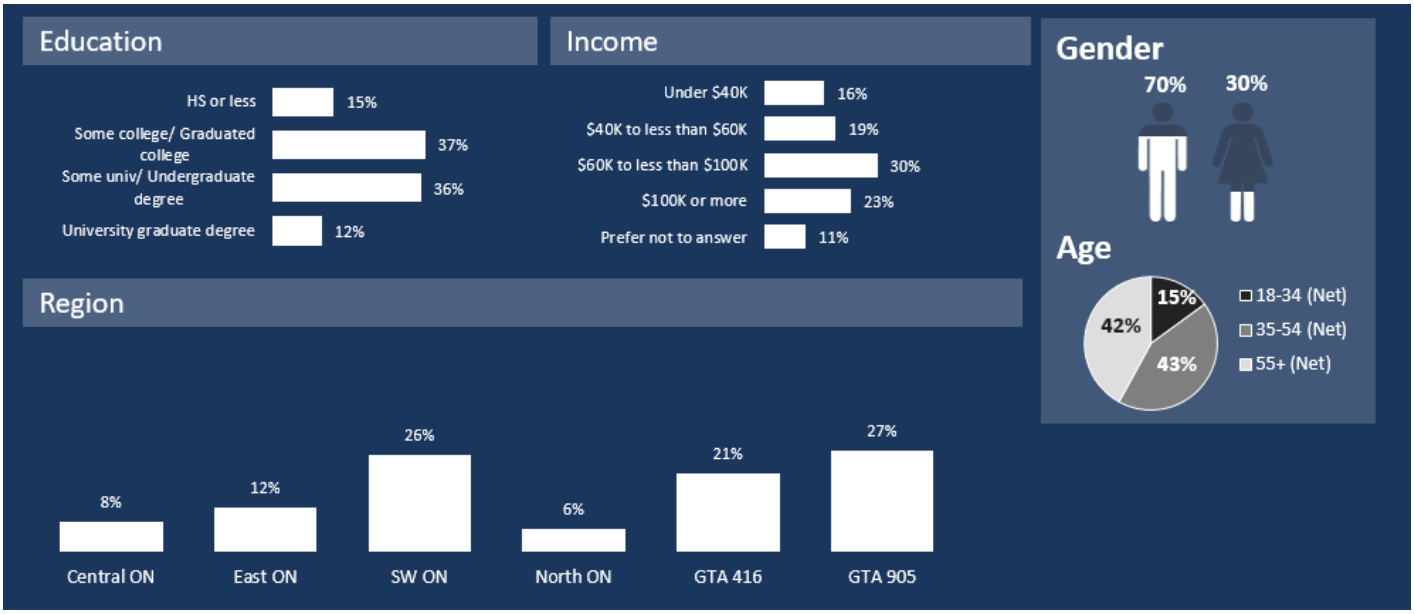
- Customers' perceptions of gasoline and diesel prices;
- Information needs;
- Perceptions of available information;[5] and
- A profile of drivers in Ontario.

The Ipsos survey was conducted online and via sampling sourced from a mix of pre-recruited respondents and from a random sample. The sample was limited to drivers in Ontario who are responsible or partly responsible for purchasing gasoline or diesel for personal vehicle use.

[5]Kent conducted research on sources of information available to consumers in Ontario.

A total of 800 drivers in the province of Ontario completed the online survey. The data was weighted by age, gender, and region to ensure that it is representative of the Ontario population. Figure 1 shows the weighted demographic data for the sample used in their report.

Figure 1: Weighted Demographic Data of the Ipsos Survey Sample



Source: Ipsos Survey Report

Section 3: Customer Perceptions, Knowledge, and Information Sources for Transportation Fuel Pricing

Summary of Findings:

1. According to the Ipsos survey results, a majority of Ontario drivers (69 percent) indicated that the price of fuel had adversely impacted their household, most often mentioning that as a result of high prices they are driving less or that it has reduced discretionary income.

2. The majority of those surveyed viewed pump prices as unreasonable (67 percent). Ipsos survey results showed that the public's attention to transportation fuels was largely focused on price variations within a region or between regions in Ontario, price variations between Ontario and other provinces, and the relationship between crude oil prices and retail gasoline prices.

3. There are currently a number of resources available to assist the public in obtaining information on pump prices. However, Ipsos found that 70 percent of drivers felt that there is not enough information on the subject. This may indicate a gap between the type of information that drivers seek and what the available resources provide.

4. Respondents that had previously sought information about fuel prices were more likely to believe that current prices were "very reasonable" (22 percent compared to 13 percent for those who had not previously sought information).

5. Thirteen percent of respondents found the available information about fuel prices to be "very trustworthy," while 45 percent found it "somewhat trustworthy." Eighteen percent found the information "a little trustworthy" and five percent found it "not trustworthy at all." Levels of trust varied according to geographic location, age, and income level.

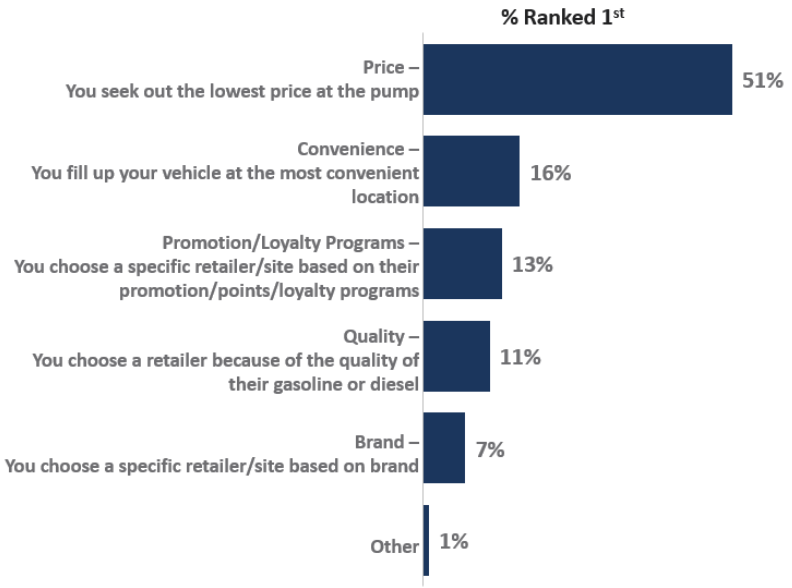
6. It appears that there is broad public demand for readily accessible and trustworthy informational resources on the subject of pump prices and pump price behaviour. This report is intended to be such a resource – a document that can serve as a reference for those seeking a more comprehensive understanding of how pump prices are set, and the factors that influence pump prices in Ontario, and in Canada.

Perceptions of Fuel Pricing in Ontario

Unlike many consumer products, petroleum products are generally considered a low-involvement purchase;[6] they are often viewed as commodities, and consequently, their typical reference point of differentiation is price. In our view, this can lead to a disproportionate focus on the price of petroleum products relative to other (higher-involvement) consumer goods such as cars, appliances, or vacations.

The Ipsos survey found that half (51 percent) of all Ontario drivers ranked price as the most important consideration when purchasing fuel, followed by convenience of location (16 percent), and promotion or loyalty programs (13 percent).

Figure 2: Factors Influencing Fuel Purchases



Source: Ipsos Survey Report - percent of responses ranked first.

Nearly seven in ten (69 percent) of Ontario drivers indicated that the price of fuel had adversely impacted their household, and these findings were more pronounced among residents in Northern and Central Ontario, as well as lower income households.

Roughly 40 percent of Ontario drivers claimed that current fuel prices forced them to drive less often, and 34 percent said it limited the amount they can spend on other items. Thirty-one percent of respondents claimed that current prices had no impact on their household, while 22 percent say that fuel prices motivated them to purchase a more fuel-efficient vehicle and 14 percent felt inclined to choose another form of transportation.

[6]Meaning low sensory involvement – a measure of a consumer's attachment to sensory elements of a purchase such as taste, smell, security/safety, emotional experience, or status.

The impact of fuel prices on behaviour was disproportionately felt by those with lower incomes. For annual household incomes below $40,000, 80 percent were more likely to take some action in response to high fuel prices,[7] compared to those who earn above $125,000 (53 percent).

In terms of drivers' perceptions about the reasonableness of gasoline pricing, Ipsos found that only 16 percent of drivers felt that the price of gasoline or diesel is at least somewhat reasonable. A slightly higher percentage of younger respondents[8] and drivers in the Toronto area were more likely to believe that the price of gas was reasonable (29 percent and 22 percent respectively, compared to 16 percent overall). Similarly, 22 percent of respondents that had previously sought information about fuel prices believed that current prices were "very reasonable," compared to 13 percent who had not sought information in the past.

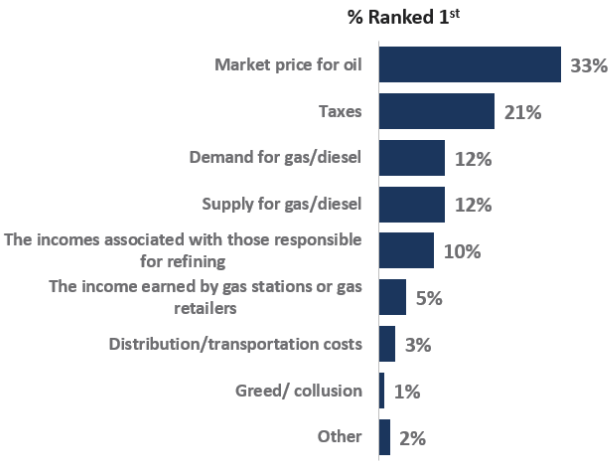
The vast majority (83 percent) of Ontario drivers surveyed had negative impressions of the fuels industry. Nearly 90 percent felt that the industry manipulates prices for profit (such as during holiday weekends), and 53 percent believe that a lack of competition is leading to unfairly high prices.

What We Heard: More Survey Findings

According to the Ipsos survey results, the public's attention on transportation fuels was largely focused on price variations within a region or between regions in Ontario, price variations between Ontario and other provinces, and the relationship between crude oil prices and retail gasoline prices.

Drivers mentioned a number of factors that they felt contributed to the cost of fuel, including those related to market and industry factors, as well as taxes (Figure 3). When asked to rank the factors that determine fuel prices, the market price for oil was ranked first by 33 percent of respondents, followed by 21 percent who felt taxes to be the most important factor.

Figure 3: Factors Determining the Price of Fuel



Source: Ipsos Survey Report

More than four in ten (42 percent) perceived fuel prices in their local area to be higher than other areas of Ontario. This finding was more pronounced in Northern Ontario, where 83 percent of respondents felt that their

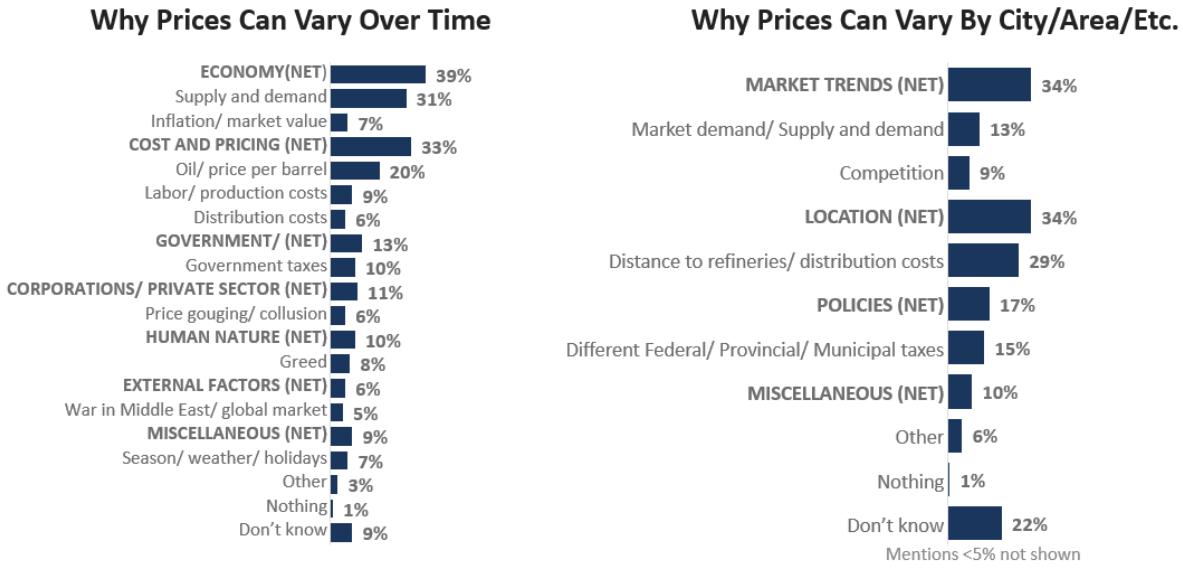
[7]Such as driving less, for example.
[8]Ages 18 to 34.

local prices were higher than the provincial average. Overall, 36 percent felt that local prices were higher than in regions outside of Ontario.

When asked to identify reasons for these types of regional price variances, Ontario drivers mentioned a range of potential causes (Figure 4). In response to why prices vary by location, respondents focused primarily on market-specific issues such as local supply and demand, and competition (34 percent), as well as issues such as distance to refineries and distribution costs (34 percent) and policies (including taxes). With respect to price variances over time, economic factors (primarily supply and demand) were the most common answer (39 percent), followed by petroleum product input costs[9] (33 percent), and government/taxes (13 percent). Other responses, such as price gouging/collusion (6 percent), greed (8 percent), and geopolitical issues (5 percent) were mentioned less frequently.

The question of price variance by location had significantly more mentions of "do not know" than for the question of price variance by time - 22 percent to 9 percent respectively.

Figure 4: Reasons for Fuel Price Variance by Time and Place



Source: Ipsos Survey

[9]Such as crude pricing, labour and production costs, and distribution costs.

A Review of Public Sources and Uses of Information on Fuel Prices

There are a number of current resources to assist the public's search for information on pump prices. Public sources of fuel price information are listed below.

- Federal Government websites, including:
    - Natural Resources Canada posts current and historical retail, wholesale, and crude price data, along with reports and analysis of price related issues within the petroleum industry.
    - Statistics Canada posts petroleum-related data, and regularly releases publications on the petroleum industry, including information on petroleum prices.
    - The Competition Bureau posts information about their work in upholding competitive markets and pricing activity. Their website includes reports, backgrounders, and statements on the Bureau's findings in regards to their cases and their advocacy work.
- Provincial Government (Ontario) websites, including:
    - The Ministry of Energy posts information about pump prices, including historical weekly price data for Ontario cities. The Ministry also provides information through the "Gasoline Report," an online and newsletter-based resource for understanding transportation fuel prices.
- Industry Organizations, including:
    - The Canadian Fuels Association provides online resources to help understand pricing and issues related to the petroleum industry. They provide data and analysis of pump prices, as well as commentary, e-newsletters, and blogs highlighting topical issues affecting the industry (many related to pricing issues). They support and fund research concerning the petroleum industry, and this research is often made publicly available through their website.
    - Kent Group Ltd provides a number of resources through their website to provide insight into Canadian fuel pricing. There is an online database of historical price/margin data, along with price charting options and analytical tools that are all publicly accessible. In addition, Kent produces a quarterly newsletter on petroleum pricing in Canada, and provides regular commentary on industry topics, which are often related to fuel prices.
    - GasBuddy provides crowd-sourced price data, as well as options for charting historical price data, a blog with regular commentary on price-

related issues, and a "fuel insights" page that allows consumers to learn more about fuel prices.

- Petroleum Marketers often post current pricing information for their retail sites, and often communicate through other forums such as blogs (such as Suncor's "PumpTalk"), or other social media to share information and engage in discussion on pricing and other topics.

The reach of the internet and the increased use of mobile devices has put many of these resources at the fingertips of consumers. However, 70 percent of drivers in the Ipsos study felt that there was not enough information on the subject of pump prices. This may indicate differences between the type of information that drivers seek and what the available resources provide.

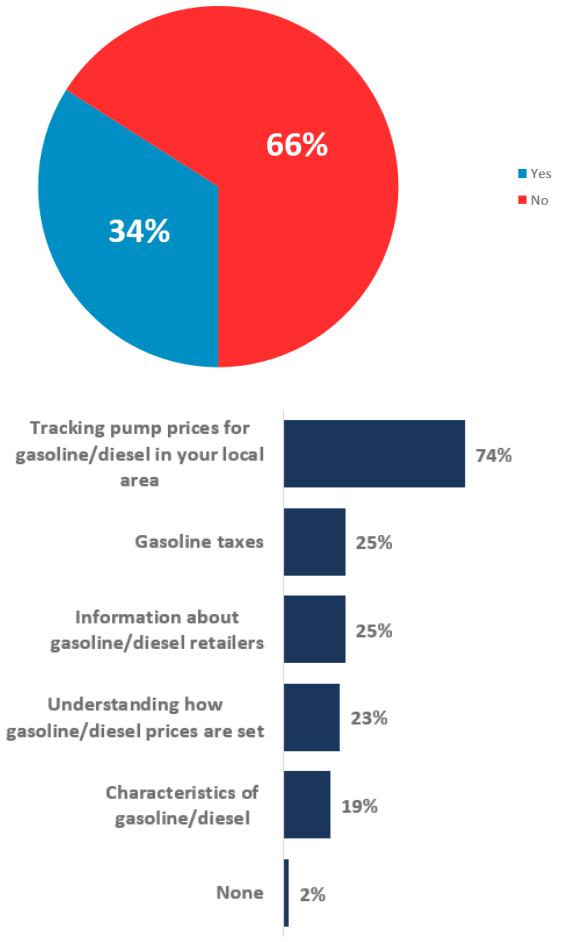
A third of Ontario drivers sought information about gasoline/diesel in the past two years, and three-quarters of those that sought information had tracked local pump prices (Figure 5). Of those surveyed, 23 percent had sought information specifically to help understand how fuel prices are set.

Drivers most frequently looked to the internet for information about transportation fuels, with 81 percent of respondents listing it as a source of information, followed by the media at 29 percent. The federal and provincial governments were further down on the list of cited sources at 11 and 7 percent respectively.

Not surprisingly, preference for sources of information followed respondents' attitudes towards the trustworthiness of those sources. The internet was listed as the most trusted source of information about fuel prices (67 percent), followed by the media (62 percent) and government sources (Federal – 46 percent, Provincial – 43 percent).

Thirteen percent of respondents found the available information about fuel prices to be "very trustworthy," while 45 percent found it "somewhat trustworthy." This compared to 18 percent that found the information "a little

Figure 5: Information Drivers sought over the last 24 months



Source: Ipsos Survey Report

trustworthy" and five percent who said "not trustworthy at all." Levels of trust varied according to geographic location, age, and income level.

Industry participants reported a general decline in the number of inquiries they have received about pump prices over the last five years, which parallels with a reported drop in the number of price-related complaints received by the Competition Bureau over that time.[10] Industry participants indicated that this may be due to the increased use of social media or other online resources that allow consumers to easily access information from trusted sources.

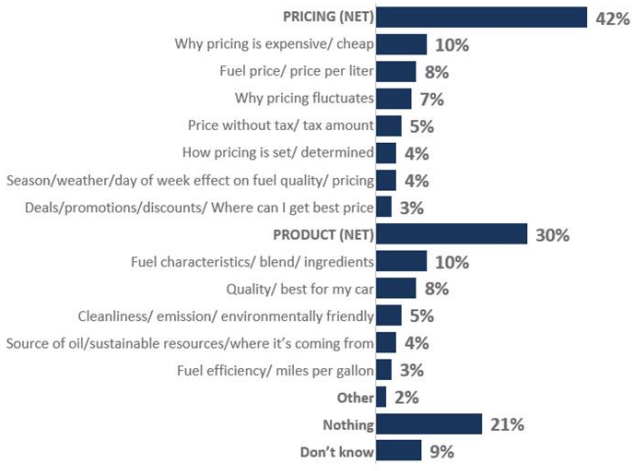
An Assessment of Public Informational Needs

The downstream petroleum industry is multifaceted and complex; there are many "moving parts" that can make it difficult to understand market activity or pump price movements. Respondents categorized their own knowledge about fuel pricing as low, with nearly three-quarters of drivers (74 percent) mentioning that they have little or no knowledge of how pump prices are set, why pump prices can vary from region to region (72 percent), or why pump prices can vary over time (65 percent). These represent gaps in the knowledge and understanding of pump prices that point to a need for more information.

Those surveyed showed some interest in receiving more information on transportation fuels, with 92 percent reporting at least the same level of interest in learning more about transportation fuels compared to two years ago. When drivers did seek information, there was a distinct interest in information on pump prices.

Forty-two percent of drivers most commonly wanted to know more about fuel prices. The most popular topics within that category were why prices rise and fall, why prices are so high, and how pump prices are determined (Figure 6); three topics that are central to this report's objectives.

Figure 6: What Information About Gasoline Prices Would You Like to Know?



Source: Ipsos Survey Report

When asked where they would prefer to go to seek additional information about pump prices, drivers cited the internet as the top source (57 percent). All other sources, including the media, and the federal or provincial government were further down the list.

It appears that there is broad public demand for readily accessible and trustworthy informational resources on the subject of

[10] Addressed in more depth in Section 8 of this report.

pump prices and pump price behaviour. This report is intended to be such a resource – a document that can serve as a reference for anyone seeking a more comprehensive understanding of how pump prices are set, and the factors that influence pump prices in Ontario, and in Canada.

Section 4: Background - The Structure of the Retail Sector for Transportation Fuels

Summary of Findings:

1. While there are more than 50 distinct brands of gasoline sold in Ontario, the three national refiner-owned brands (Esso, Shell, and Petro-Canada) appear at more than half of all gas stations in the province. However, the displayed brand at a gas station is not necessarily indicative of who supplies fuel to the site, nor of who owns the site's assets, nor of who is responsible for setting the pump price. In fact, Ontario's 3,228 retail sites involve range of business relationships and operating structures between a number of refiners, more than 40 different fuel marketers and thousands of retailers.

2. The distribution of retail outlets by type of operation has implications for the setting of pump prices. In 2016, only 22 percent of Ontario's gas stations had their prices set by a major integrated oil company, whereas 78 percent of sites had their prices set by independent retailers or one of 25 different non-refiner marketer organizations.

3. There is generally a higher percentage of retailer-controlled pricing at outlets in smaller markets, while pump prices are more often set by integrated refiners or larger non-refiner marketers in larger markets like the Greater Toronto Area.

The Retail Fuel Landscape: A Profile of Ontario and Canada

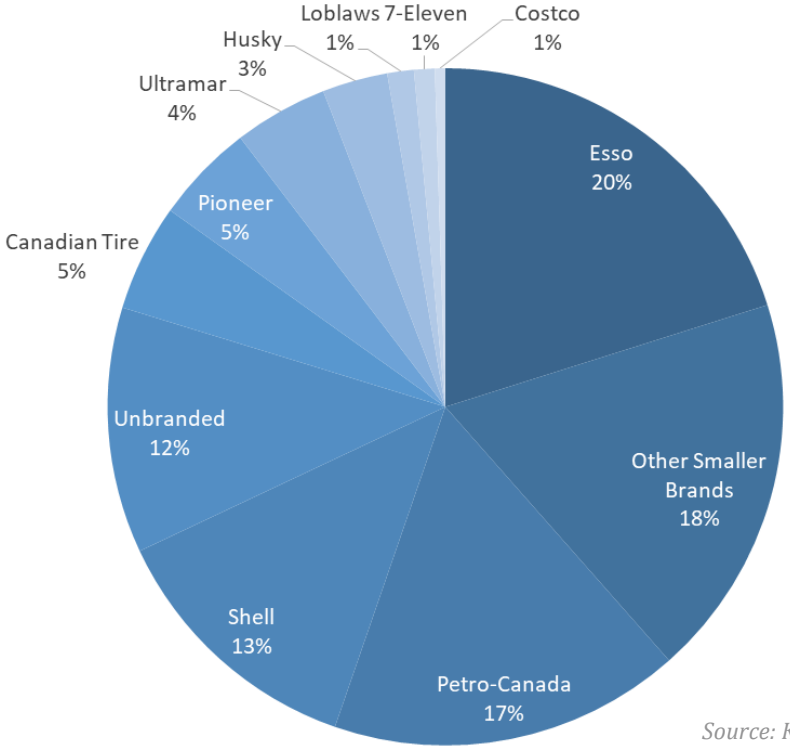
Kent's 2016 retail site census identified 96 distinct brands of gasoline in Canada, and 55 distinct brands within Ontario. The current principal brands in Ontario's retail fuel market are represented in Figure 7.

The most common retail gasoline brands in Ontario are those owned by refiners: brands such as Petro-Canada, Shell, and Esso appeared at 53 percent of the 3,228 retail gasoline stations in Ontario at the end of 2016, while the remaining sites either sold their own brand of fuel or had an "unbranded" offering. In Canada, refiner-owned brand names also appeared at 53 percent of its 11,931 retail fuel sites in 2016.

However, the posted brand at a gas station is not necessarily indicative of who has the primary relationship with the site, who owns or controls the site assets, or who is responsible for setting the pump price. A variety of companies "market" Canada's major brands of gasoline, meaning that they have the primary supply relationship with those sites. The Esso brand for example, is marketed by ten different companies, and some Shell sites are marketed under similar arrangements. These marketer organizations typically operate under a branded supply agreement with a refiner-owned brand, and

benefit from the brand recognition, marketing support, and loyalty programs of the established brand.

Figure 7: Ontario Share of Market by Number of Outlets by Brand

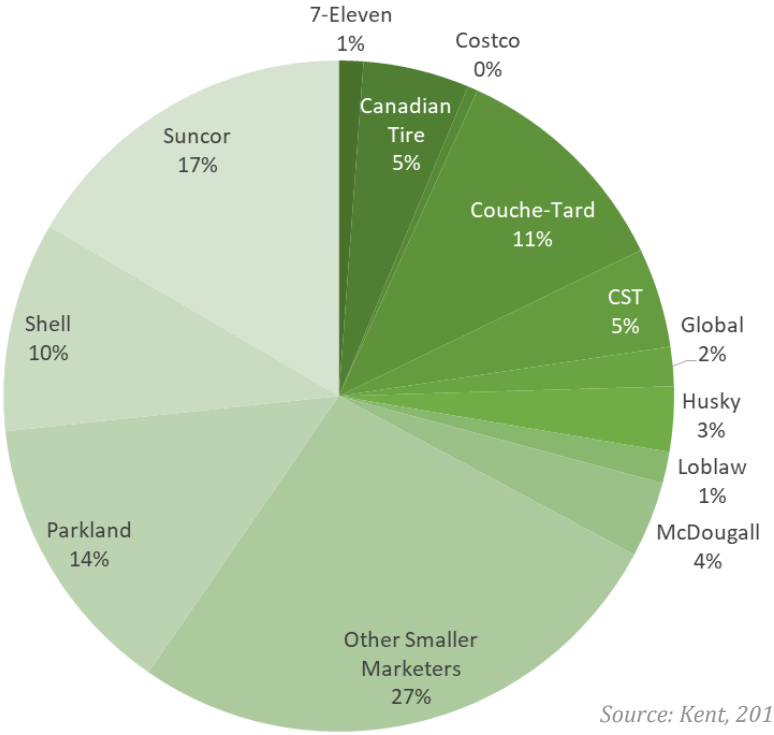


Source: Kent, 2016

After the sale of Imperial Oil's remaining Esso branded retail assets was finalized in 2016, the company became the first major Canadian refiner-marketer to be completely divested of its retail operations. This approach to brand marketing is not new, but refiner-marketers are increasingly willing to have a brand presence simply by allowing other organizations to manage the relationship with former branded associate sites. This allows a refiner to focus on its highest-volume outlets, or in the case of Imperial Oil, to entirely focus their resources further upstream.

There were 69 distinct companies involved in the marketing of retail petroleum brands in Canada, and 41 distinct marketers operating in Ontario. The vast majority of these companies are non-refiners, meaning they are not producers of fuel. There has also been a rise in the representation of what is referred to as "non-traditional" fuel marketers, meaning their primary business may be something other than petroleum – this includes companies such as Couche-Tard, Costco, 7-Eleven, and Loblaws. Figure 8 shows Ontario's market share (for number of outlets) by marketer in 2016.

Figure 8: Ontario Share of Market by Number of Outlets by Marketer



Source: Kent, 2016

Refiner-Marketer Relationships

A gas station selling a given brand of gas may seem straightforward; it may seem intuitive to believe that the brand owner is also the owner/operator of the station. However, the selling of petroleum products depends upon a variety of business relationships between a refiner, a marketer, and a retailer. The marketer generally holds initial title to the refined petroleum as it leaves the wholesale supply point (rack point), and sometimes owns the brand name seen at the retail outlet; while the retailer manages the day-to-day operations at the retail outlet.

The nature of these relationships spans a broad range, generically divided between "controlled," and "non-controlled."[11] In fact, there exists a myriad of types of retailer-marketer relationships, and a variety of types of brand marketers (Figure 9), which fall into one of two broad categories:

- **Integrated Refiner-Marketers**: marketers whose corporate structure includes one or more (domestic) refineries. There are seven refiner-marketers operating a total

[11]Defined by whether the marketer owns the petroleum inventory and therefore sets the pump price (controlled) or the retailer owns the petroleum inventory and sets the pump price (non-controlled).

of 10 gasoline producing refineries in Canada.[12] Examples would include Suncor/Petro-Canada and Shell, and these types of operations represented 30 percent of Ontario's retail sites in 2016.

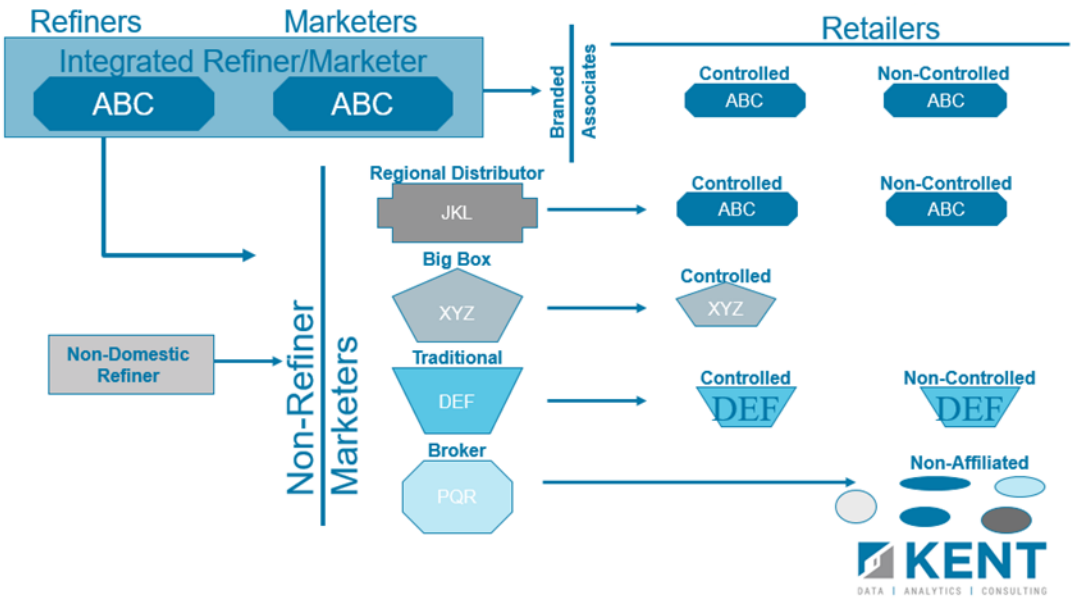
- **Non-refiner Marketers**: marketers who obtain supply from a refiner that is not part of the same organization. Examples would include Canadian Tire and Parkland Fuels[13], and these types of operations represented 70 percent of Ontario's retail sites in 2016.

Non-refiner marketers can then be classified in one of four ways:

- **Traditional non-refiner marketer**: A marketer whose primary offering is petroleum operating a chain of traditional gas stations under their own brand. This type of operation represented roughly 47 percent of Ontario's sites in 2016, and an example would be Parkland Fuels operating the Pioneer brand.
- **Regional Distributor**: An independent marketer who operates a number of retail outlets which carry a well-known brand (usually a refiner's brand), under a supply and licensing arrangement. This type of operation represented roughly 33 percent of Ontario's sites in 2016, and an example would be Couche-Tard and Global Fuels operating under the Esso brand.
- **Wholesale Broker**: A marketer who buys from a refiner and sells to independent retailers who are typically not affiliated with any sort of recognized brand. This type of operation represented roughly 17 percent of Ontario's sites in 2016, and an example would be Parkland Fuels supplying fuel to unaffiliated or unbranded sites.
- **"Big Box" Marketer**: A marketer whose primary offering is non-petroleum in nature, and whose fuel sites are often anchored by a large chain-store. These locations are usually "high volume" retail fuel sites. This type of operation represented roughly 3 percent of Ontario's sites in 2016, and an example would be Costco.

[12]There is four additional gasoline producing refineries in Canada operated by two non-marketing refining companies (Imperial Oil and Valero).
[13] Parkland Fuels is one the largest marketers of fuel in Canada, operating nearly 2,000 sites nationally under a variety of brands including Fas Gas, Esso, Pioneer, and Ultramar.

Figure 9: Refiner-Marketer-Retailer Relationships



Marketer-Retailer Relationships

To understand the range of operating modes at retail sites, they must be understood from several perspectives, principally those of:

- Brand-owner involvement: is the marketer directly involved in operating all or part of the retail network bearing its brand?
- Inventory ownership and price control: does the marketer directly manage pricing decisions, or is this the responsibility of the retailer?
- Site asset ownership; and
- Treatment of back-court operations like convenience stores.

Several possible relationships, or modes, exist between retailers and their suppliers, and this is of some importance with respect to price setting and competition in this sector. The most common relationships between marketer and retailer take the following forms:

1. Company Operated Outlets

In this mode, the retail outlet is owned and operated entirely by the marketer. The principal retailer and attendants are salaried employees of the marketer, and all inventory and revenues belong to the marketer. The marketer, as owner of the product, controls the setting of the pump price. This is often how non-traditional fuel retailers like Couche-Tard and 7-Eleven operate, along with most big-box outlets like Costco.

Control of Pump Price	marketer
Retailer Compensation	salary from marketer; the retailer is actually an employee of the marketer
Ownership/control of outlet site	marketer
Ownership of petroleum inventory	marketer
Operation of Ancillary Services	typically the marketer
Percentage of all Ontario outlets operating under this mode in 2016	13%

2. Commission Operator Outlets

In this mode, the outlet facilities and petroleum inventory are owned by the marketer, but a retailer operates the site and is compensated by a commission payment, usually based on cents per litre of petroleum sales. The retailer in turn hires attendants, and pays them from their commission revenue. Since the marketer owns the petroleum product at this type of outlet, the marketer retains control of the retail pump price. This is often how marketers choose to operate at their higher-volume outlets in more urban areas like the Greater Toronto Area.

Control of Pump Price	Marketer
Retailer Compensation	A commission from the marketer; based on pump sales volume.
Ownership/control of outlet site	Marketer
Ownership of petroleum inventory	Marketer
Operation of Ancillary Services	Typically the retailer, who may pay the marketer a lease fee for the use of merchandising space
Percentage of all Ontario outlets operating under this mode in 2016	45%

3. Lessee Outlets

In the lessee mode, the marketer typically owns/controls the principal facility assets (pumps, land, buildings) which in turn is leased out to the retailer or lessee. The lessee purchases petroleum product from the marketer and in turn resells to consumers at a pump price established by the lessee. There are very few lessee arrangements remaining in the market, because as lease contracts have expired marketers often converted the site to a commissioned operator, or sold the assets to an independent retailer.

Control of Pump Price	Lessee
Retailer Compensation	Lessee buys product from the marketer, and sells at the posted pump price. The margin between these two prices is the retailer's gross revenue, and means of compensation
Ownership/control of outlet site	Marketer, who would typically charge a lease fee to the retailer for the use of the facility
Ownership of petroleum inventory	Lessee
Operation of Ancillary Services	Typically the lessee, who may pay the marketer a lease fee for the use of merchandising space
Percentage of all Ontario outlets operating under this mode in 2016	~1%

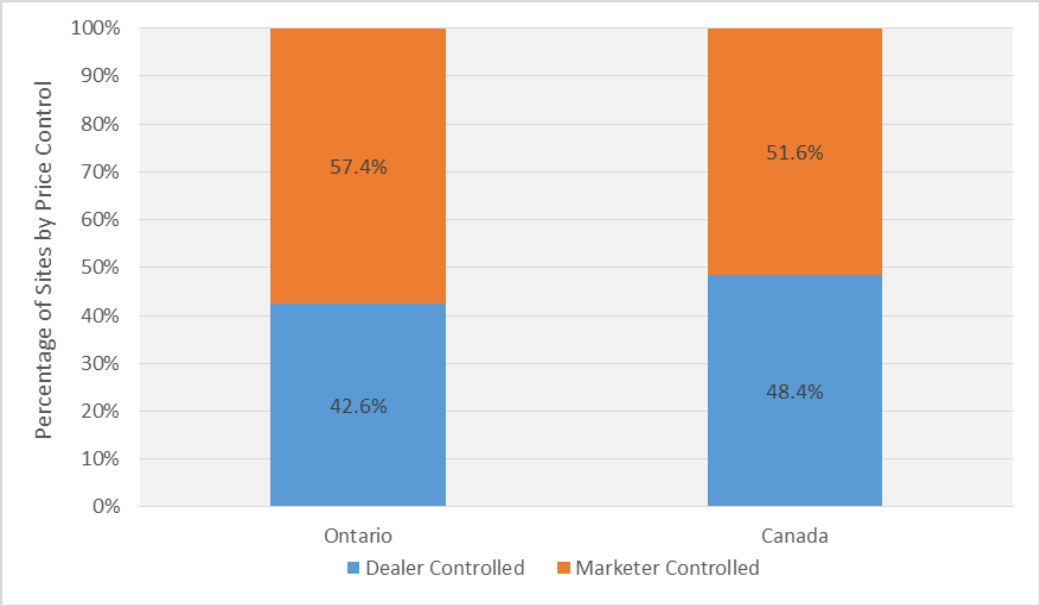
4. Independent Retail Outlets

In this mode, the site's facilities are owned by the retailer. The retailer buys the petroleum product from the marketer and resells to consumers at a retailer-established retail price. The retailer pays most or all of the expenses associated with operating the outlet, and maintains complete control over the retail pump price. This mode of operation is increasingly common, and is typical of sites in less urban areas or smaller markets, such as those in Northern Ontario.

Control of Pump Price	Retailer
Retailer Compensation	Retailer buys product from the marketer, and sells at the posted pump price. The margin between these two prices is the retailer's gross revenue, and means of compensation
Ownership/control of outlet site	Retailer
Ownership of petroleum inventory	Retailer
Operation of Ancillary Services	Retailer
Percentage of all Ontario outlets operating under this mode in 2016	42%

The distribution of retail outlets by mode has implications for how pump prices are set. Figure 10 shows that at the end of 2016, 57 percent of all retail sites in Ontario had their pricing decisions made by the marketer, meaning then that the retailer sets the pump price at the remaining 43 percent of sites in Ontario.

Figure 10: Percentage of Retail Sites by Price Control Type



Source: Kent, 2016

Of the marketer-controlled sites in Ontario, 38 percent are operated by an integrated oil company - Shell, Petro-Canada, or Husky - the remainder being operated by one of 25 different marketer organizations. Put simply, marketer control of fuel prices in Ontario is effected by almost 30 different entities, while dealer control of fuel prices in Ontario is effected by about 1,380 individual retailers.

Overview of Supply and Distribution Infrastructure in Ontario

Supply and distribution infrastructure in Ontario transports refined products from their point of production (refineries), through various modes of transportation, to where it can be stored, and then ultimately distributed to retail fuel sites. This infrastructure is critical in defining competitive regions or markets, and has implications for the determination of prices at each stage of product movement through the supply chain.

Refineries and Pipelines

Suncor's refinery in Montreal, the Imperial Oil refinery in Nanticoke, and three Sarnia-area refineries (Shell, Suncor and Imperial Oil) supply Ontario with nearly all of its refined products. All of these refineries transfer a large portion of their production onto pipelines that deliver products to primary distribution terminals along the way.

The movement of petroleum products, whether over a short distance or over hundreds of kilometers, is typically accomplished through pipelines due to its low cost relative to other transportation modes. The Trans-Northern Pipeline (TNPL) supplies refined products from terminals in Montreal westward to Toronto and from Nanticoke eastward to Toronto. Three additional pipelines move fuel from Sarnia's refineries to terminals in London, Hamilton and Toronto.

Marine and rail transportation are most effective in regions not served by pipelines. These modes consequently represent the main links between refineries and the primary distribution terminals that receive, store, and then deliver fuel to retail sites in areas like Northern Ontario.

Primary Distribution Terminals

Distribution terminals are facilities that receive refined petroleum products via pipeline, ship, or rail, hold those products in inventory, and then deliver fuel, primarily via tanker-truck, to an end-use customer like a retail gas station.

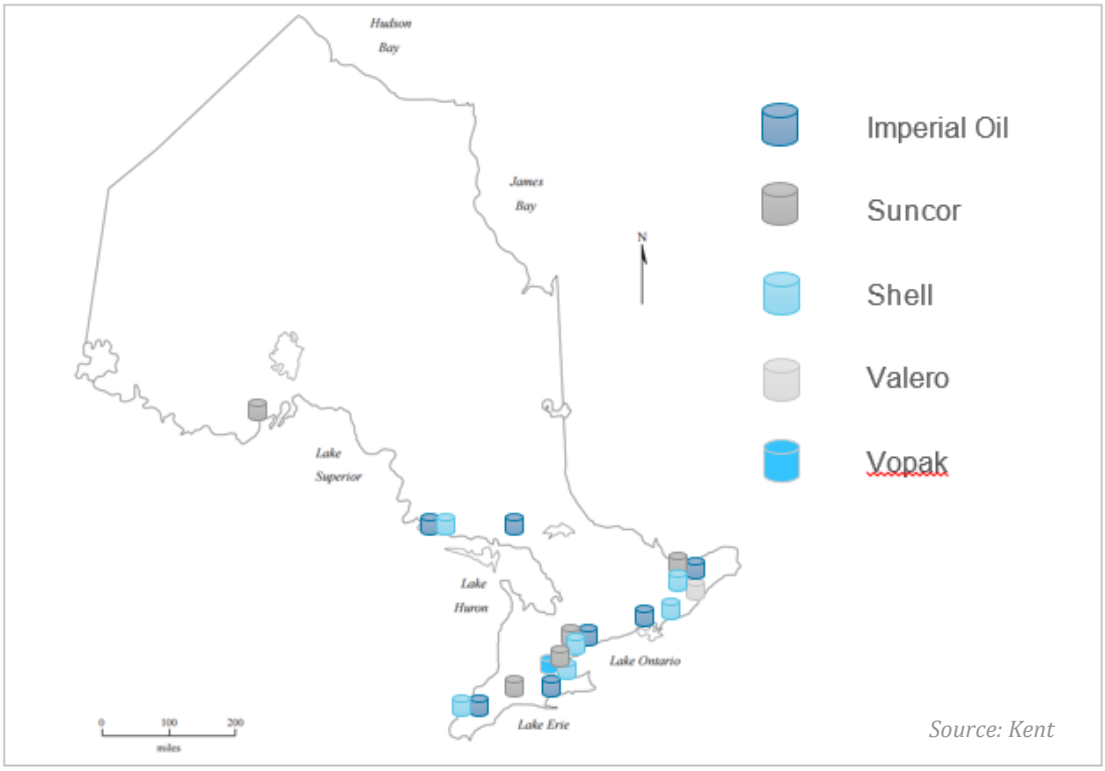
Two types of terminal facilities perform this role:

- Primary terminals, which handle larger volumes, and are typically the first point of inventory after the refinery; and
- Bulk plants, which handle smaller volumes, and almost always receive the product by way of a primary terminal, rather than a refinery

Forty years ago, petroleum marketers maintained dedicated networks of primary distribution terminals. Today, marketers often operate from common terminals in order to reduce overall operating costs, with the terminal operator receiving a fee from the organizations lifting product from their terminal.

Refiners own all but one Ontario terminal, the Vopak terminal in Hamilton, which operates its facility as a service for hire, rather than as part of an integrated supply chain. Terminals tend to be located close to major population centres. Each of the four Ontario refineries have a terminal on-site and there are approximately 16 additional primary terminals in Ontario (Figure 11).

Figure 11: Primary Terminal Locations in Ontario



While most terminals are supplied from pipelines, some terminals, such as those located in Sault Ste. Marie or Thunder Bay, can receive product by marine transportation. Other forms of supply to terminals, such as rail, are generally limited to locations further removed from refineries, pipelines, or waterways - the terminal located in Sudbury, for example. The distance and method by which petroleum products are transported into a terminal can contribute to regional differences in wholesale prices, and by extension, pump prices. Rail is generally a more expensive mode of transportation than marine or pipeline and can add to the cost of delivering fuel to regions that rely on rail transportation.

Bulk Plant Facilities

A bulk plant is a smaller storage and distribution facility, usually receiving product from a primary distribution terminal as opposed to directly from a refinery. Bulk plants are often located where it would be uneconomical or impractical to deliver product to the end-use customer directly from a primary terminal.

Bulk storage plants are greater in number and generally more dispersed into remote areas that are not served by primary terminals, such as in the northern parts of Ontario. There are over 70 bulk fuel stations currently operating under at least six brands of fuel in Ontario. Distribution through a bulk plant adds a layer to the supply chain and would typically result in higher distribution costs for retail sites that are supplied in this manner.

Many bulk plant operations are independent owner-operators, but are contracted to sell a specific brand of fuel, much in the same way an independent fuel retailer can sell branded fuel through a supply contract with a refiner. This differs from primary terminals which are typically refinery owned and operated, with salaried employees.

Section 5: Understanding Transportation Fuel Price Components

Summary of Findings:

1. The primary components of pump prices are upstream (or crude price), refiner margin (gross revenue generated by a refiner), retail margin (gross revenue generated by a retailer), and taxes on fuel.

2. Pump prices are a consequence of a number of component gross margins and taxes, and their defining prices, meaning the price at which petroleum products are transferred (sold) from one sector of the industry value-chain to the next. This is known as the price/margin model.

3. In Ontario, 2016 upstream operations had revenues of 33.6 cents per litre, refining operations 22.0 cents per litre, and retail operations 8.2 cents per litre. These amounts effectively represent gross margins, which represents all business costs as well as profits.

4. In Ontario, the 2016 tax component of pump prices was 36.2 cents per litre - the largest single price component. This generated roughly $5.9 billion in gasoline tax revenues, which equates to $745 per registered light-duty vehicle in Ontario, and $1,133 per household in the province.

An Overview of the Pump Prices

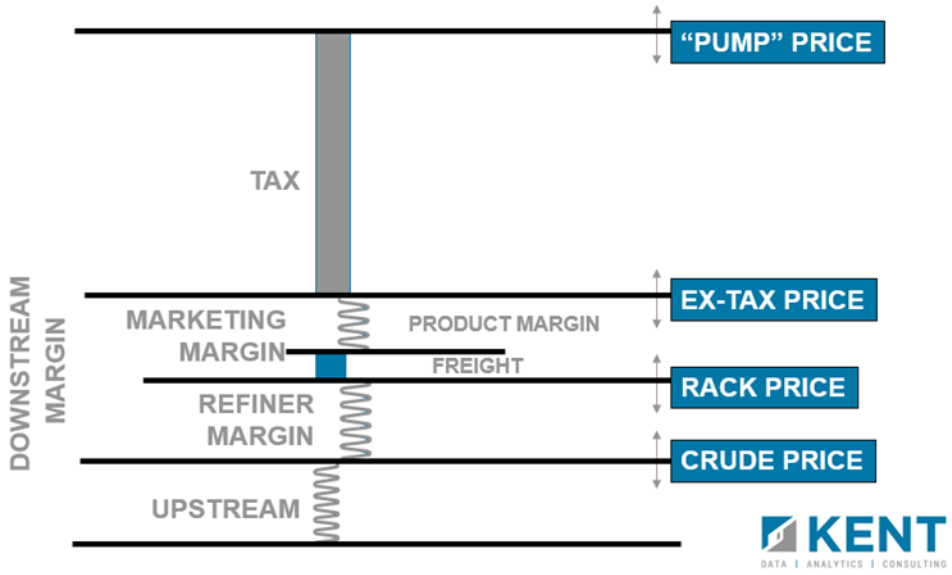
The petroleum industry is vast and multifaceted, yet most consumers relate to it in one specific way: as consumers of gasoline. Unlike many consumer products, the particular attribute of gasoline that is of fundamental concern to consumers is its price.

Price changes at the pump, and as displayed on a street sign, provide no further insights into the factors that drive pricing in the industry. To understand pump price economics in the retail gasoline sector requires a clear understanding of the interrelationships between the principal stakeholders who ultimately share the revenue from the sale of a litre of gasoline.

These relationships can be modeled, as they are in Figure 12. The interface between each of the stakeholders in this model is defined primarily in terms of the price at which product is transferred from one sector of the industry to the next.

This price/margin model thus creates a common reference for understanding the economics of retail gasoline, and serves to explain the factors that determine retail gasoline prices at any given time.

Figure 12: Components of the Pump Price / Margin Model



The revenue from the retail purchase of a petroleum product (such as gasoline) is split among four key sectors, each essentially taking a share[14] of - or margin from - the total pump revenue. Each margin is defined by its related markets and their associated prices.

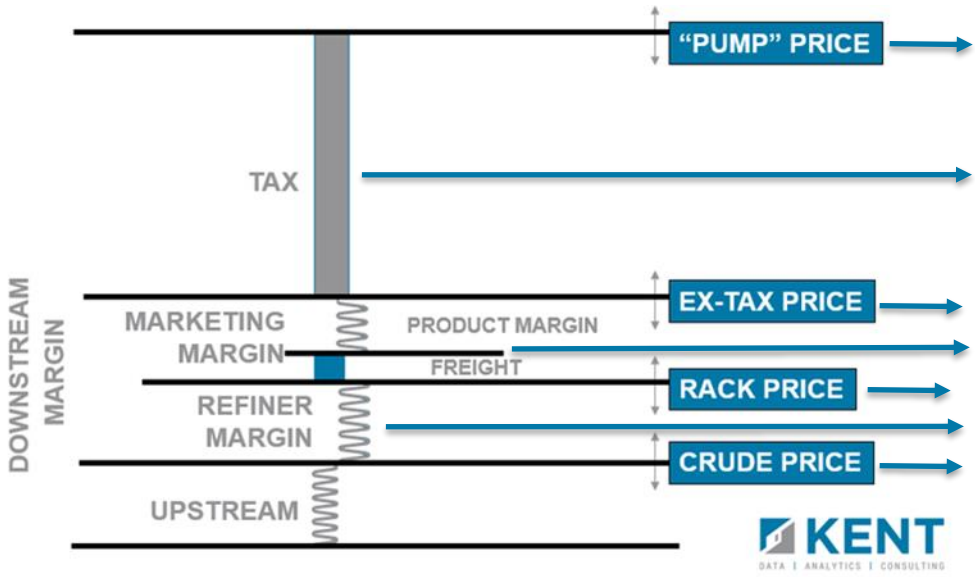
Before examining each of the model elements, it is important to define the term "margin." While this term is often associated with the phrase "profit margin," (implying that margin represents net income or "profit"), use of the term herein relates to gross margin, which is simply the difference between two price points. For example, the retail price (the price at which the product is sold) less the wholesale price (the price a marketer pays for the product they sell) defines the retail margin. Gross margins then represent revenue only; any operating expenses must be considered before determining profits.

[14] The revenue from a petroleum sale filters down to the principal stakeholders in various ways. Ultimately however, these stakeholder revenues are derived from the retail sale.

Pump Price/Margin Model: An Integrated View

Having identified the pump price/margin model elements, Figure 13 integrates the model with the 2016 gasoline prices for Canada[15] and Ontario,[16] to derive a representative value for each of the associated margins.

Figure 13: 2016 Average Prices/Margins for Regular Gasoline



	Canada Average (¢/L)	Ontario Average (¢/L)
"PUMP" PRICE	102.8	100.0
TAX	38.0	36.2
EX-TAX PRICE	64.8	63.8
MARKETING MARGIN	8.8	8.2
RACK PRICE	56.0	55.6
REFINER MARGIN	22.9	22.0
CRUDE PRICE	33.1	33.6

Source: Kent

For Ontario in 2016:

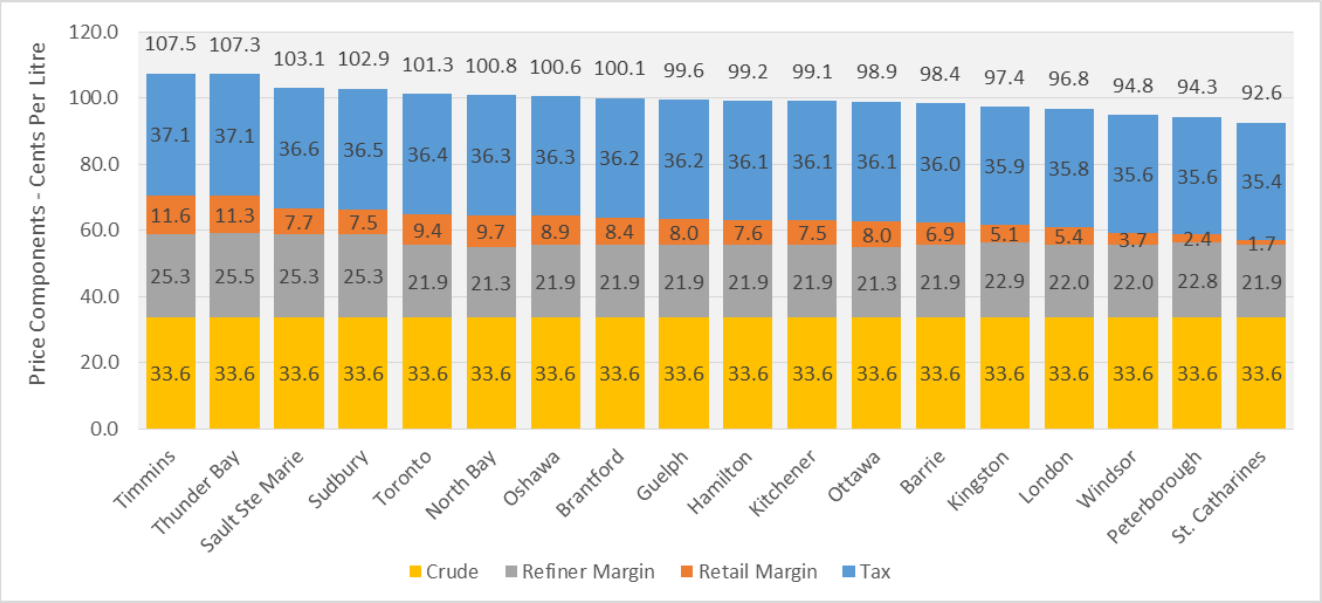
- Tax accounted for 36.2 cents per litre, the largest distinct price component.
- Upstream operations realized 33.6 cents per litre.
- Refining operations realized 22.0 cents per litre.
- Marketing or retail operations realized 8.2 cents per litre.

[15] 10 city volume-weighted average. Cities include: Vancouver, Calgary, Regina, Winnipeg, Toronto, Montreal, Saint John, Halifax, Charlottetown, and St. John's.

[16] 18 city volume weighted average. Cities include: London, North Bay, Ottawa, Sault Ste Marie, St Catharines, Sudbury, Thunder Bay, Timmins, Toronto, Windsor, Hamilton, Kingston, Kitchener, Oshawa, Peterborough, Barrie, Brantford, Guelph

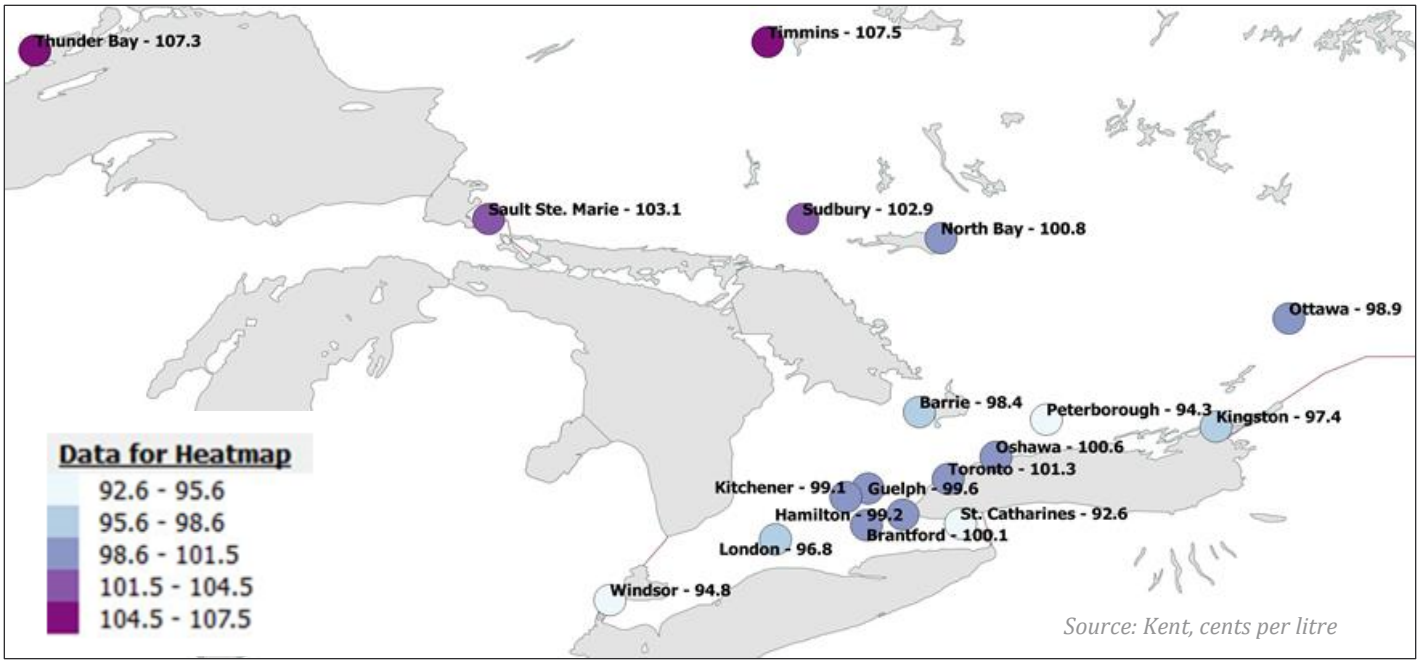
Figure 14 shows the average annual pump price components from 18 Ontario markets in 2016, and Figure 15 shows a mapped version of average annual pump prices across the province for the same period.

Figure 14: 2016 Average Pump Price Components (Margins) in Ontario Markets



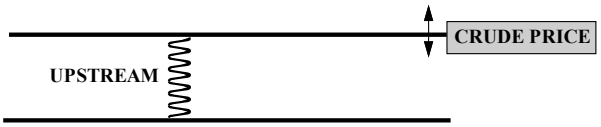
Source: Kent

Figure 15: Map of 2016 Average Annual Ontario Pump Prices



Source: Kent, cents per litre

Although the upstream industry is not the focus of this report, it is important to examine its relationship with the downstream industry, and the role it plays in affecting pump prices.



It is often difficult to precisely quantify the upstream "content" in the price of gasoline, due to the variety of crude types used in the refining process. Refineries purchase different types (or grades) of crude oil based on their specific refinery set-up and production plan, and these different types of crude oil can have varied pricing. For instance, lighter crude types are generally more expensive than heavier crudes, and that could dramatically change the crude price basis used in the calculation of refining margins.

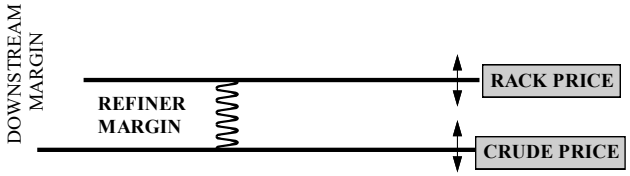
Kent uses a weighted average price for crude based on the proportion of crude types input into Canadian refineries on a regional basis. Western Canada is derived from a mix of Light Synthetic Crude Oil,[17] and WCS,[18] Atlantic Canada and Quebec are derived from Brent,[19] and Ontario is derived from a split between Canadian Light-Sweet and WCS.

Crude oil is a commodity which is traded in a global marketplace; consequently, Canadian producers must compete to sell their production to refiners, alongside other producing nations. As a relatively minor contributor to the world crude supply, Canadian producers are "price takers" rather than "price setters" for crude; that is to say, our crude prices rise and fall according to market prices established beyond our borders.

The upstream portion of pump prices is represented as elastic in Figure 13 implying that it fluctuates, which it does continuously, in response to various crude markets around the world. While some feel that pump prices should rise and fall exactly with the price of crude, it is only one of several factors that influence pump prices.

Refining and the Wholesale Refined Product Market

Within the downstream industry there exists two distinct sectors: *refining*, which manufactures petroleum products from crude oil, and *marketing,* which in essence, buys



[17] A light crude produced by upgrading heavy bitumen.
[18] Western Canada Select – a heavy crude mix produced in Western Canada.
[19] A light sweet internationally traded crude benchmark.

refined products from the refiner and sells or consigns them to retailers or end-use customers.

The refining sector represents the manufacturing stage of the petroleum product life-cycle. Refineries acquire crude oil, and from this feedstock, manufacture a range of refined products including gasoline, diesel, heating fuels, and lubricants.

Although a description of the process of turning crude oil into gasoline is outside of the scope of this report, one of the key aspects of this sector is the very high capital cost of a refinery: a newly built refinery can cost between 5 and 15 billion dollars, depending on its complexity. In addition, day-to-day plant operations are cost-intensive, involving energy, personnel, maintenance, and numerous safety and environmental measures.

Price/Margin Model Elements

For simplicity, the pump price model uses the term "rack price" to refer to the refiner's sale price of refined petroleum. In fact, refiners sell their product under a variety of arrangements, which can be broadly categorized as follows:

- Rack price - the price charged for immediate supply on an "as available" basis.
- Contract price - the price charged to a non-refiner marketer (or other sales channel customers) usually under the terms of a long-term supply agreement.
- Transfer price - this is the "internal" price charged by a refiner to the marketing arm of the same company.
- Dealer price – the price charged to a retailer under the terms of a supply agreement.

Of these refiner prices, only rack price information is readily available in the public domain. Contract and transfer prices are not openly shared, as they relate to negotiated and confidential terms between sellers and buyers. Although contract and transfer prices are distinct from rack price, they largely use rack price as their basis, since the market-driven rack price provides an objective and transparent measure of the current market value of a refined product.

In simple terms, the gross refiner margin is the price at which the refiner sells its refined product, less the price at which it bought its raw material[20] (rack price minus crude price). Since both crude and rack prices fluctuate according to their own respective market forces, the refiner margin is elastic, being squeezed or expanded between these two distinct market-derived price points.

[20] In fact, the refiner typically pays a higher price than the benchmark crude price, reflecting the cost of transporting the crude from the producing region to the refinery plant. For simplicity, this model only uses the benchmark crude value, which may cause refining margins to be slightly overstated, but with no material effect on the build-up of pump prices.

The Canadian Wholesale (Rack) Market

The existence of rack price in a given market is not of itself indicative of a competitive wholesale rack market. For a competitive rack market to exist, a considerable volume of petroleum product must actually trade using rack price as the transaction basis. If, for example, Canadian refiners produced only sufficient product to supply their own networks of retail facilities, there would be little or no market-driven competition in the refining sector.

However (and increasingly), a great deal of Canadian refinery output is sold outside of the refiner's own marketing infrastructure or branded supply contracts with distributors[21] - this takes the form of unbranded gasoline supply to independent petroleum marketers, which in Ontario represents supply to nearly half of all retail outlets.[22]

These independent marketers naturally seek to purchase their product at the lowest available cost, from any one of several regional refiners, who compete for a share of this demand. This is why there has historically been a high degree of competition, and thus price uniformity, between nearby rack points in North America.

The range of potential refiner sources from which a marketer can choose is largely dependent on the distance and transportation costs involved in bringing the product from a particular rack point (primary terminal) to the destination market. In practical terms, this limits a marketer to a relatively short range (perhaps 1,000 km) for overland truck transport, but where pipeline or marine fuel terminal facilities exist, wholesale refined product is moved across very large distances, even overseas, due to the relatively small transport cost.

With a large proportion of the Canadian population within a few hundred kilometers of the United States or able to receive marine supply, many US and European refineries are potential sources of wholesale product supply for Canadian non-refiner marketers.

Canadian refiners must therefore be price competitive not only with each other, but with their US and European counterparts on an exchange-adjusted basis.

In Canada, many refiners also participate, to some extent, in the marketing and retailing of petroleum products. In the case of integrated refiner-marketers, the question of the internal selling price, or transfer price, arises, as there is no obvious market mechanism to regulate its setting.

In practice, integrated refiner-marketers establish transfer prices at, or close to, market-driven rack prices. There is no net gain in setting an unrealistic transfer price: a higher

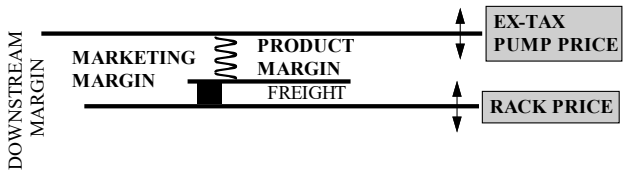
[21] This refers to branded contractual arrangements with companies selling refiner branded product to refiner branded sites - such as Couche-Tard operated Esso sites being supplied by Imperial Oil through an exclusive branded supply contract.

[22] Based on Kent 2016 Retail Site Census.

than market transfer price, for example, would produce better than expected refiner income, but at the expense of retail income.

Petroleum Marketing and Retail

The petroleum marketing sector represents the final stage of the pump price model. It is this sector which has direct contact with the petroleum consumer and it is this sector, in the minds of many consumers, which "sets" the retail price of gasoline. It is also within this sector that prices and competitiveness issues attract considerable public, media and regulatory attention.



Once the refining process is completed, the finished product (gasoline, for example) is sold or transferred at the current wholesale price, and is then transported to the retail outlet. As the product leaves the refining facility, it falls into the domain of the marketing sector. The marketing sector provides the entire infrastructure for bringing refined products from the point of production to the end-use consumer.

The marketing margin (also often referred to as the retail margin and sometimes referred to as the "rack-to-retail" margin), is defined between the market-driven price points of the ex-tax (tax removed) pump price, and the rack price. This margin represents the revenue which provides for two key operations:

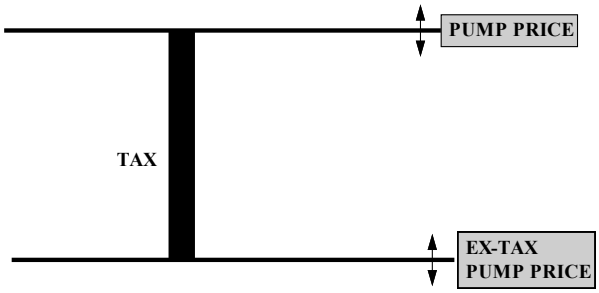
- **Freight**: Freight (or distribution) is the transportation of petroleum products from the rack or refinery to the final point of sale, which in the case of retail gasoline, is typically a gas station. Although some petroleum marketers conduct their own freight operations, this is generally outsourced to third-party common carriers. Freight costs do not typically fluctuate, and are generally less than a cent per litre in most major Canadian cities, but can be higher in markets further removed from a refinery, or a primary terminal.

- **Product sales**: Within this domain, petroleum marketers, together with retailers, incur a variety of costs, typical of any retail business. Unlike most other retail enterprises however, storing and dispensing a product such as gasoline adds considerably to the operating cost. Major costs include labour/compensation and sales processing costs.

In reference to non-controlled outlets, this margin is shared between the marketer and the retailer, demarcated by the dealer's wholesale price – a price for wholesale product charged to the retailer and set by the marketer under the terms of a supply agreement, generally above the posted rack price.

Taxation on Petroleum Products

Unlike retail margins, the tax content of the pump price is essentially a pre-determined, and stable amount, regardless of market conditions. The majority of motor fuel taxes are applied as a fixed number of cents per litre. A small portion of motor fuel taxes (GST/HST and in Quebec PST) are applied on a percentage basis, and so move with changes in the pump price. For example, if the pump price in Ontario were to decrease 10 cents per litre, the variable tax component falls by roughly 1.2 cents per litre.



The order of application for taxes is important because the excise tax, provincial tax, and carbon costs (carbon taxes in places like BC, or cap and trade costs in Ontario and Quebec) are added prior to any percentage based calculation of GST/HST. When carbon pricing was added in Ontario, for instance, there is also a GST/HST component calculated onto the price of carbon. In Ontario, the cap and trade carbon cost of 4.3 cents per litre of gasoline would result in an additional 0.56 cents per litre of HST, which is included in the price at the pump.[23]

[23] Making the aggregate impact of that cap and trade cost roughly 4.9 cents per litre.

Table 1 shows the taxes and cost of carbon for retail gasoline by province, which are typically made up of:

- A ten cent per litre federal excise tax;
- Provincial motor fuel tax;
- Carbon pricing;
- In a small number of markets, municipal taxes; and
- GST/HST (and in Quebec PST).

*Table 1: Taxes and Retail Prices for Regular Gasoline on January 1, 2017**

Province	Provincial Tax (¢/L)	Federal Excise Tax (¢/L)	Municipal Tax (¢/L)	Carbon Tax/Price (¢/L)	GST/HST (%)	Total Calculated Tax (¢/L)	Retail Price (¢/L)	Tax as % of Retail
BC	14.5	10.0	11.0, 3.5[1]	6.67	5.0%	44.7	124.2	**36.0%**
Alberta	13.0	10.0		4.49	5.0%	32.4	103.5	**31.3%**
Saskatchewan	15.0	10.0			5.0%	29.8	101.5	**29.4%**
Manitoba	14.0	10.0			5.0%	28.8	101.0	**28.5%**
Ontario	14.7	10.0		4.3[3]	13%	41.8	111.3	**37.6%**
Quebec	19.2	10.0	3.0[2]	4.3[3]	5.0% +9.975% QST	49.2	115.1	**42.7%**
New Brunswick	15.5	10.0			15.0%	40.0	111.4	**35.9%**
Nova Scotia	15.5	10.0			15.0%	40.1	111.6	**35.9%**
PEI	13.1	10.0			15.0%	37.8	112.5	**33.6%**
Newfoundland	33.0	10.0			15.0%	61.0	137.8	**44.2%**
Yukon	6.2	10.0			5.0%	21.8	117.7	**18.5%**
NWT	10.7	10.0			5.0%	26.5	121.5	**21.8%**

*2017 data was selected to include the impact of carbon pricing.
Note 1 - 11.0 ¢/L transit tax applies in Vancouver, and 3.5 ¢/L municipal tax applies in Victoria.
Note 2 - 3.0 ¢/L municipal tax applies in Montreal
Note 3 - Cap and trade carbon pricing is incorporated as an additional input cost in the wholesale price, it is assumed here that 100% of that additional cost is passed on by the refiner/wholesaler to the retail price

The petroleum industry acts as a collector of these taxes, which in Ontario amounted to 41.8 cents per litre (on January 1, 2017 using an 18-city average), or roughly 38 per cent of the average pump price at the time. This represented the single largest component of pump prices in Ontario at the time.

According to recent analysis conducted by Kent, Canadian motor fuel taxes on gasoline and diesel represented approximately $22 billion[24] in federal, provincial, and municipal revenues in 2016. In Ontario, the amount of revenue generated from motor fuel taxes was $7.4 billion in 2016, of which $5.9 billion comes from gasoline. Using the demographic data available from the 2016 Canadian Census, annual gasoline taxes equated to $745 per registered light-duty vehicle in Ontario, and $1,133 per household in the province.

The tax content in pump prices has increased steadily over the last 20 years; in Ontario it happened primarily through the change from GST to HST in 2010, and the recent addition of carbon pricing through its cap and trade program. The annual revenues that Ontario generated from motor fuel taxes have increased 31 percent over the last decade, which is in line with the average increase of other Canadian provinces over that time.

[24] $16.5 billion for gasoline and $5.5 billion for diesel.

Section 6: Trend Analysis - Why Pump Prices Change over Time

Summary of Findings:

1. In inflation-adjusted (constant) dollars, current Canadian prices are only 6 cents per litre higher than in 1991, and are actually down from a decade ago.

2. The average Ontario crude price expressed as a percentage of the average rack price has been fairly stable, indicating that crude prices are a significant driver of rack price changes over time.

3. There is a distinct seasonality to Canadian gasoline demand, increasing in the spring and summer months, and falling in the winter months. Pump prices, driven largely by underlying changes in wholesale gasoline prices, exhibit a similar, albeit less distinct pattern - rising and falling alongside demand.

4. The amount of available refining capacity can also influence prices. Higher refinery utilization rates often lead to higher and more volatile refining margins.

5. Exchange rates can influence wholesale prices and thus refining margins. As the Canadian dollar weakens relative to the U.S. dollar, Canadian prices for crude and wholesale refined products tend to rise to maintain a similar value as U.S. dollar-priced commodities.

6. For most of the past 25 years, Canadian retail margins averaged between 4 and 7 cents per litre but have risen over the last 3 years. Canadian average retail margins reached 9.1 cents per litre in 2017, and while the Ontario average retail margin followed a similar upward trend, it has tracked below the national average margin since 2004.

7. The recent rise in retail margins can largely be attributed to three factors: a deceleration of site closures leading to slower growth in average sales volumes, plateaued revenue growth from maturing investments in ancillary offerings, and slowed market penetration for big-box retailers.

8. While variation in the tax component of pump prices is usually limited, Ontario had two major changes since 2002. The first was the transition from GST to HST on July 1, 2010, which led to a nearly seven cent per litre increase in gasoline taxes. More recently, Ontario introduced cap-and-trade legislation that puts a price on carbon emissions. Based on current cap-and-trade emissions credit pricing, this equates to roughly 5 cents per litre.

The Factors Affecting Pump Price Changes Over Time

Retail pump price trends are principally a reflection of changes in the underlying rack (wholesale) prices, which in turn, are principally a reflection of changes in the underlying price of crude oil.

Figure 16 depicts the Canadian volume-weighted average pump price, ex-tax equivalent price, rack price, and relative crude cost. It also identifies the associated margins, as defined by the pump price/margin model. Several observations can be made from this:

- Fluctuations in average rack prices have closely followed changes in underlying crude costs;
- There appears to be little lead or lag in the timing of rack price fluctuations relative to crude price changes;
- Fluctuations in average pump prices (ex-tax) have closely followed changes in underlying rack prices; and
- There appears to be no lead or lag in the timing of pump price fluctuations relative to rack price changes.

Figure 16: Canadian Monthly Average Gasoline Component Prices

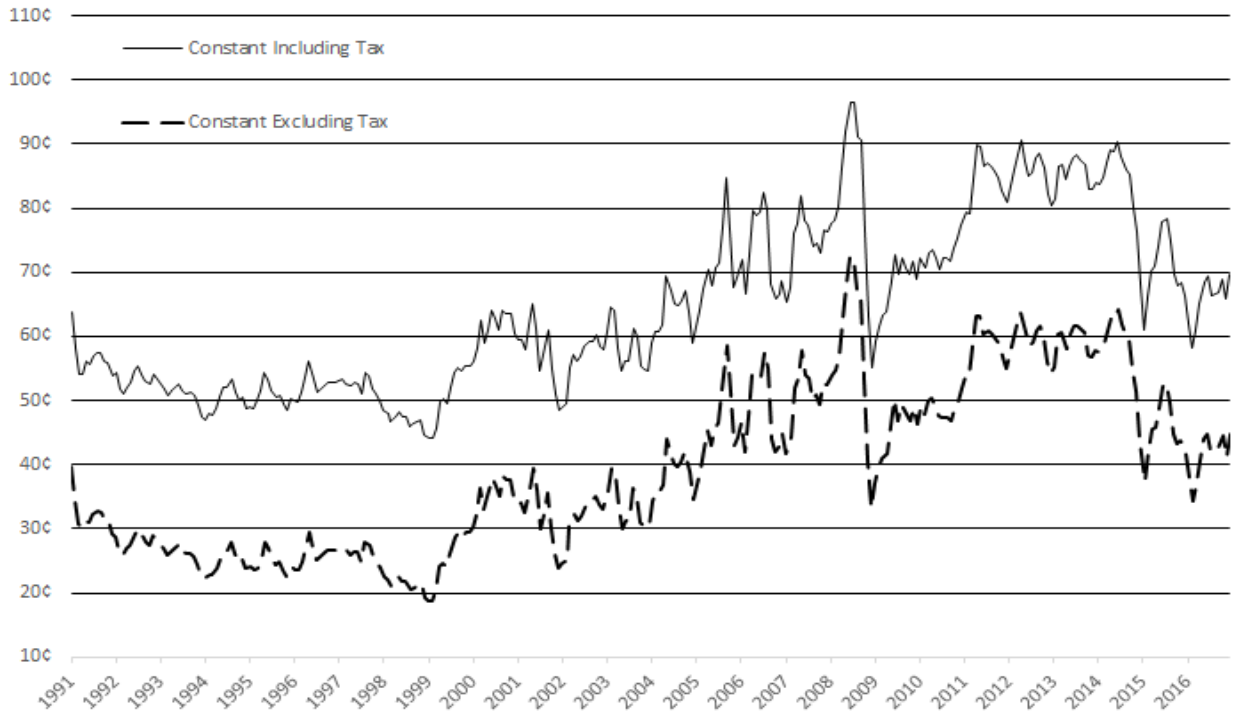
Source: Kent, 2002-2017

Still, pump price changes do not occur in exact lock-step with rack prices, nor do rack prices exactly follow crude costs; this is because of other market factors which can affect rack or pump prices at any given time. The following sections discuss the presence and impact of the factors affecting pump price changes over time.

Pump Prices and Inflation

A common perception among consumers is that gasoline prices are steadily rising; rising prices are common to most consumer goods and services, however. The historical record of gasoline prices against general measures of inflation (Figure 17) shows that while pump prices have fluctuated, current pump prices are only about 6 cents per litre higher than in January 1991.[25] When pump prices are shown without their tax content, the current constant dollar price is only about 5 cents per litre more than in January 1991, and is actually down 0.2 cents per litre from 10 years earlier.

Figure 17: Inflation-Adjusted Average Canadian Retail and Retail Ex-Tax Prices

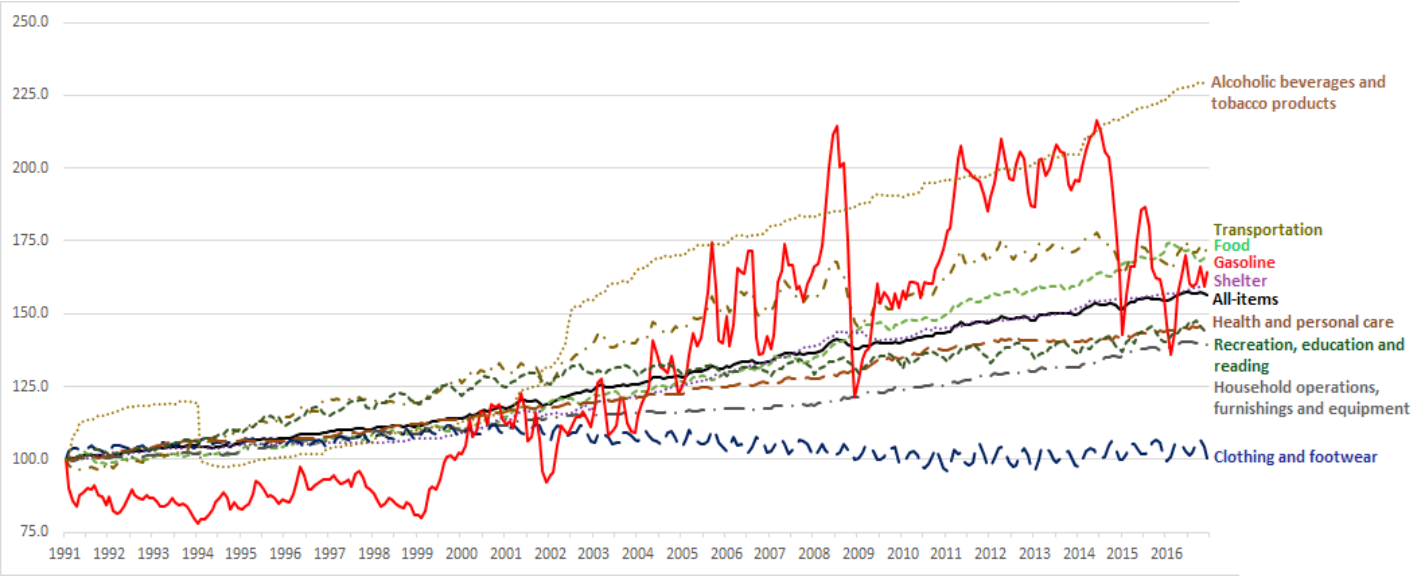


Source: Kent and Statistics Canada, 1991-2016 – CPI Base = 1991$

When compared to other major product groups over the past 25 years (Figure 18), the inflation of gasoline prices has been slightly above the "all-items" average. From 1991 to 2004 gasoline prices lagged the average CPI-based inflation rate, and had settled below Alcohol and Tobacco, Transportation, and Food indexes, while remaining just above Shelter and Health indexes.

[25] The earliest date we had detailed national average price data for.

Figure 18: CPI Index Comparisons



Source: Statistics Canada, selected goods & services

Historical Price Component Changes in Ontario and Canada

Wholesale Price and Refiner Margins

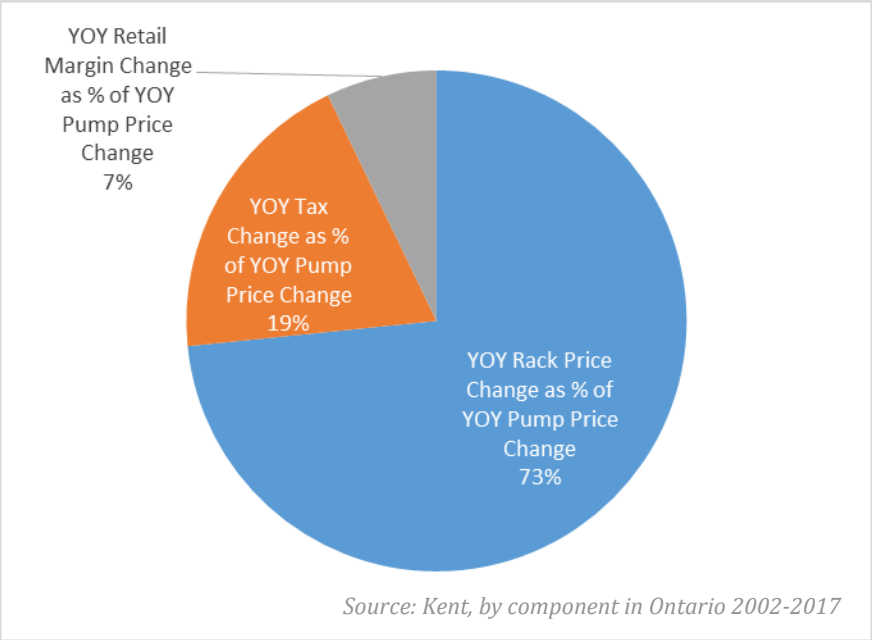
When viewing pump price changes over the past 15 years, it is clear that the wholesale price component of the pump price model has had the most significant influence on changes in retail prices over that time. Figure 19 shows that Ontario's year-over-year rack price changes accounted for 73 percent of the year-over-year pump price changes since 2002. This is largely a result of the inherent volatility of the factors that affect wholesale pricing.

The primary factors driving change in wholesale prices over time are:

- Crude input costs;
- Seasonality of demand;
- Refinery utilization rates; and
- Exchange rates.

Each of these factors are addressed in the following section.

Figure 19: Year-over-Year Cost Changes as a Percentage of Total Year-over-Year Pump Price Change



Source: Kent, by component in Ontario 2002-2017

Changes in Crude Input Costs

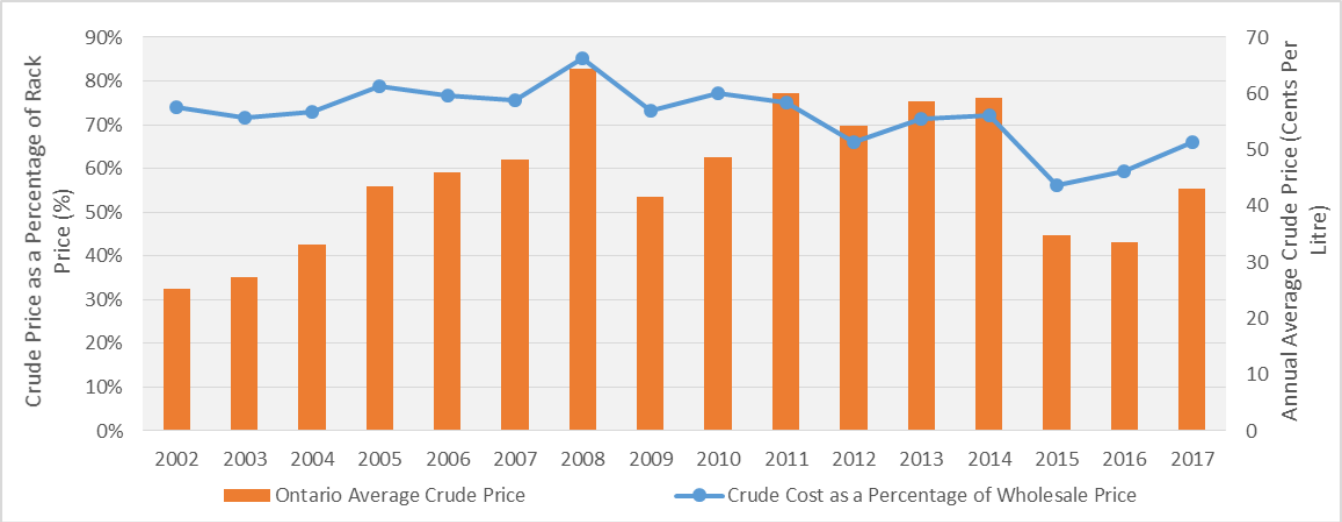
Crude prices are largely determined by international crude markets and commodities exchanges. The cost of crude purchased by refiners is generally based on an agreed upon (contract) price that is established against exchange-based crude benchmark prices.[26] This price can vary however, by the quality of crude (light vs heavy crudes), and due to the cost of transporting the crude from the seller's point of storage to the refinery.

Figure 20 shows the movement of the monthly average crude price in Ontario[27] since 2002, and also shows crude cost as a percentage of the average Ontario rack price over that time. Ontario crude prices fluctuated between 25 cents per litre and 65 cents per litre since 2002, averaging 46.5 cents per litre. Over the first five months of 2017 the average crude cost was 44.3 cents per litre, or just below the 15 year average.

Crude costs as a percentage of rack prices were fairly stable, averaging between 70 percent and 80 percent for most of the last 15 years. The relative stability in crude cost as a percentage of the rack price indicates that crude prices are a primary driver of rack price changes over time.

[26]These would include heavily-traded and transparent crude benchmark prices like WTI, Brent, and WCS.
[27] This refers to the posted benchmark crude price, as opposed to the refiner's acquisition cost of crude.

Figure 20: Ontario Average Crude Cost vs Crude Cost as a Percentage of Rack Price



Source: Kent

One of the primary factors in the movement of Canadian crude prices is the global supply and demand balance for crude oil, and crude inventory levels. Crude prices shot upwards in 2007 and 2008 in response to robust economic growth, a bullish outlook for petroleum demand, and limited global spare crude production capacity. Crude prices then collapsed in late 2008 and early 2009 as a global economic recession took hold, creating a decline in demand.

Crude prices rebounded in 2010, following a recovery in demand, and the period of high crude prices that followed led to opportunities for new crude production to come online. Growth in fracking of shale oil formations in the U.S. (which was now economically viable) led to a near doubling of U.S. crude production over a five-year period. This rise in production created a global surplus of crude oil, caused a record rise in crude inventories, and led to another collapse in global crude prices.

More recently, global crude supply continued to surpass demand, inventories have grown, and while some crude markets have moved upwards, it is likely to be a long and slow rise in price while the global surplus of crude oil dissipates.

Seasonality in Demand for Transportation Fuels

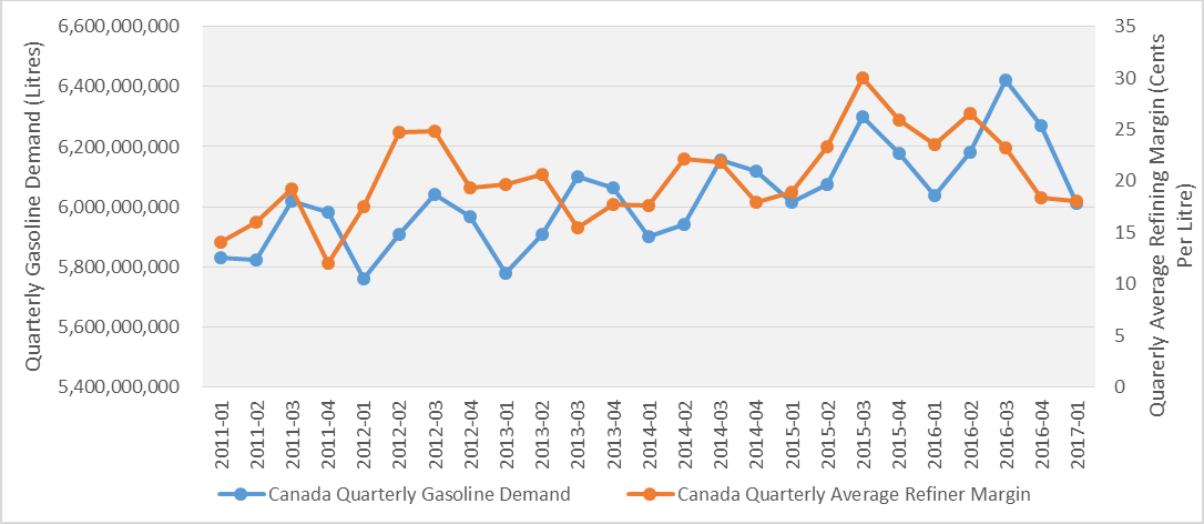
There is a distinct seasonality to Canadian gasoline demand, increasing in the spring and summer months, and falling in the winter months. Pump prices, driven largely by the underlying changes in wholesale gasoline prices, exhibit a similar pattern - rising and falling concurrent with demand.

Since crude prices do not show a seasonality, the seasonality in wholesale gasoline prices is therefore generally attributable to the refiner's margin. Figure 21 shows

Canadian gasoline demand[28] from 2011 to 2016, compared to the average Canadian refining margins for the same period.

The rising demand for gasoline which occurs every spring has a diminishing effect on product inventories across North America. As fuel buyers attempt to secure supply of this diminishing inventory, conditions begin to favour a "seller's market," and as would be expected in any commodities market under these conditions, the price tends to be bid upwards.

Figure 21: Canadian Quarterly Gasoline Demand vs Refining Margin



Source: Kent, 2011-2016

This pattern of price movement may be perceived by some as evidence of a lack of competition, yet in the latter half of each year, as demand recedes and inventory improves, a "buyer's market" develops, and prices tend to fall.

Whether in the spring or fall, price fluctuations at the rack (and consequently at the pump) are a reflection of competition among buyers' and sellers' positions alike. Seasonal fluctuations in pump prices are then linked to the supply and demand of refined products and wholesale product inventory levels, a common feature of most market-based wholesale commerce.

The traditional supply and demand model predicts that when demand rises, so do prices, and this is often the case for seasonal gasoline prices. On a longer-term basis however, refiner margins do not always follow this model, since wholesale prices and refiner margins can fall, despite rising demand or vice-versa. In this case, there are other factors affecting the supply side of the economic model related to petroleum products, and one of those factors is refinery utilization rates.

[28] In the 300+ markets included in the Kent Volumetric Database.

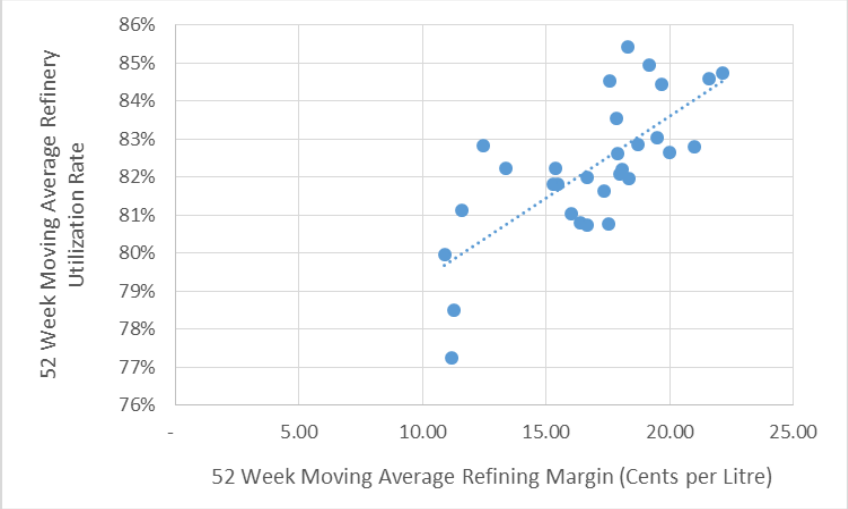
Refinery Utilization Rates

Refinery utilization rate is generally defined by the crude inputs into a refinery expressed as a percentage of the maximum crude processing capacity of that refinery. Therefore, a refinery operating at a 90 percent utilization rate is producing at 90 percent of its maximum capability.

As a refinery's output approaches its capacity, there are limited options to expand production without building additional capacity (which can involve significant time and capital). This can create a scenario where demand exceeds the ability to supply a product, and as with any commodity, purchasers will bid-up the price of the finite supply. With gasoline, this would lead to a rise in the rack price, and is a primary reason that higher average refinery utilization rates often lead to higher and more volatile refining margins.

Figure 22 shows the link between average utilization rates at Canadian refineries and average refining margins; the correlation between the two variables is strong (0.7).

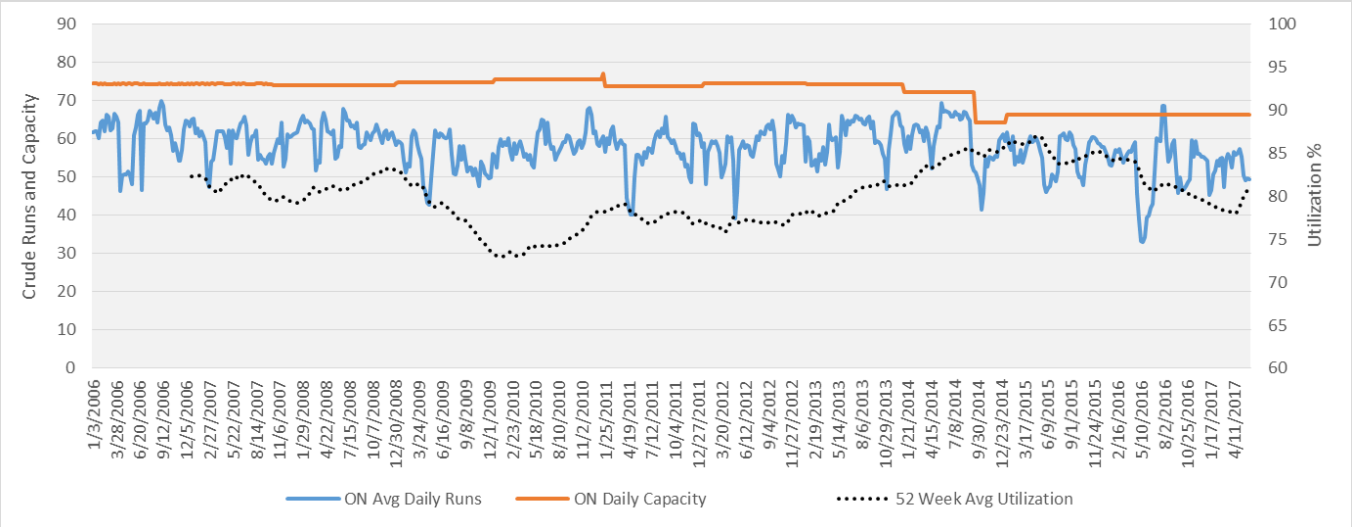
Figure 22: Canadian 52-week Moving Average Refinery Utilization Rate vs Refining Margin



Source: Kent and National Energy Board, by Quarter 2010 - 2017

However, the relationship between utilization rates and refiner margins does not fully explain recent movements in Ontario's rack prices and refiner margins. Despite relatively low utilization rates at Ontario refineries, refining margins in 2016 were higher than would be expected – in fact, Ontario refining margins in 2016 were nearly 5 cents per litre higher than they were in 2013 despite utilization rates dropping over that time (81.4 percent to 79.4 percent - Figure 23).This change is largely due to the effect of exchange rates on rack prices.

Figure 23: Ontario Refinery Crude Inputs, Capacity, and Utilization Rates



Source: National Energy Board, 2006-2017

The Impact of Exchange Rates on Rack Prices and Refiner Margins

The free-trade agreement between the U.S. and Canada ensures that refined products can move freely across the border, and typically, this results in competitive (exchange-adjusted) wholesale gasoline prices between proximate U.S. and Canadian markets.

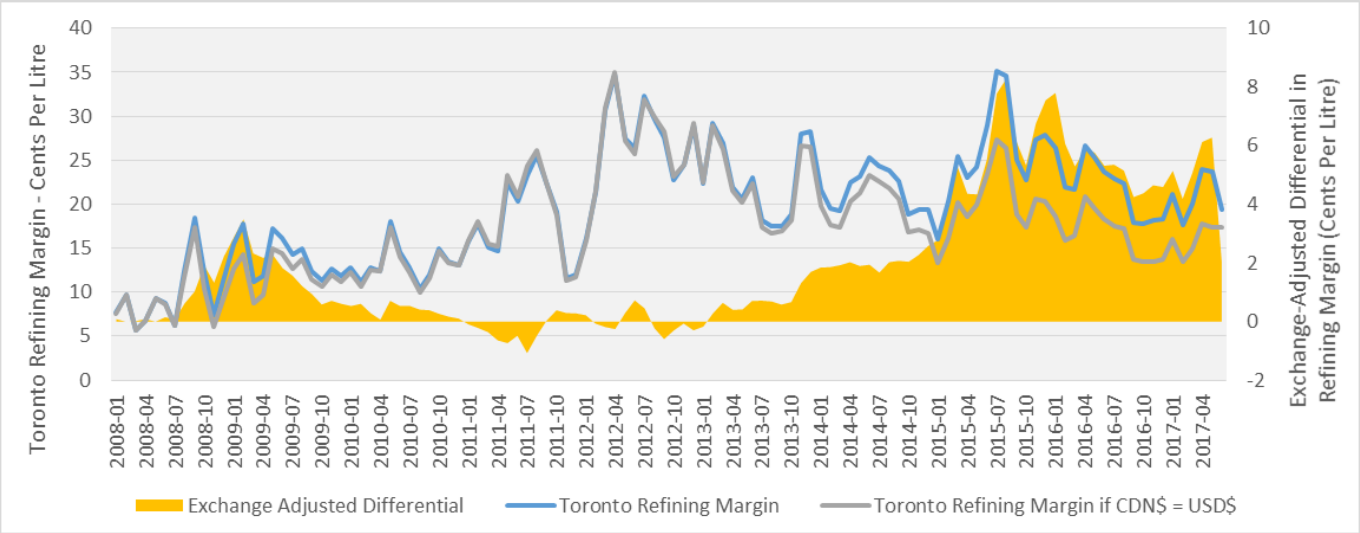
If the Canadian dollar weakens relative to the U.S. dollar, Canadian crude and wholesale prices tend to rise to maintain a comparable value to U.S. dollar-priced commodities. If a Canadian seller were to not adjust their prices in this case, U.S. buyers could take advantage of the relatively low prices in Canadian markets by purchasing available supply and re-selling at a higher relative price in U.S. markets.[29] To maintain security of supply and to prevent a potential loss of revenue, Canadian wholesalers can adjust their prices to be similar to U.S. wholesalers on an exchange-adjusted basis.

This adjustment in the wholesale price has the effect of increasing or decreasing Canadian refining margins. Figure 24 illustrates this effect that exchange rates can have on Canadian refiner margins by calculating those margins from crude and rack prices that are adjusted by the rate of exchange (effectively converting them to a U.S. denominated competitive price). This shows that over the last 2-3 years, as the Canadian dollar weakened, refining margins (denominated in Canadian dollars) were 4 to 7 cents per litre higher than they likely would have been if the Canadian and U.S. dollars were at parity.

Ontario refining margins in 2016 were roughly 5 cents per litre higher than they were in 2013, despite a drop in utilization rates, and a primary contributor to this was the shift in the exchange rate from 1.03 $CDN>$USD in 2013, to 1.33 $CDN>$USD in 2016.

[29]This is known and arbitrage, which is the simultaneous buying and selling of a commodity (like gasoline) in different markets in order to take advantage of differing prices.

Figure 24: The Effect of a Weakening Canadian Dollar on Ontario Gasoline Refining Margins

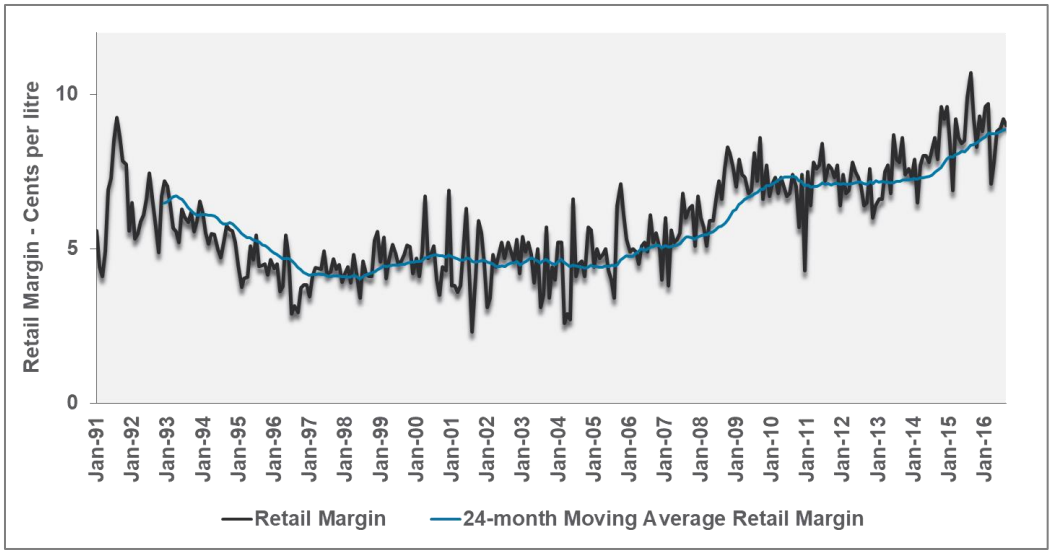


Source: Kent, 2008-2017

Retail Margin History and Analysis

For most of the past 25 years, Canadian retail margins[30] averaged between 4 and 7 cents per litre, and when adjusted for inflation, had actually declined over that period. It has only been the last few years that these margins have risen above their historical norms.

Figure 25: Canadian Average Retail Margin History



Source: Kent, 1991-2016

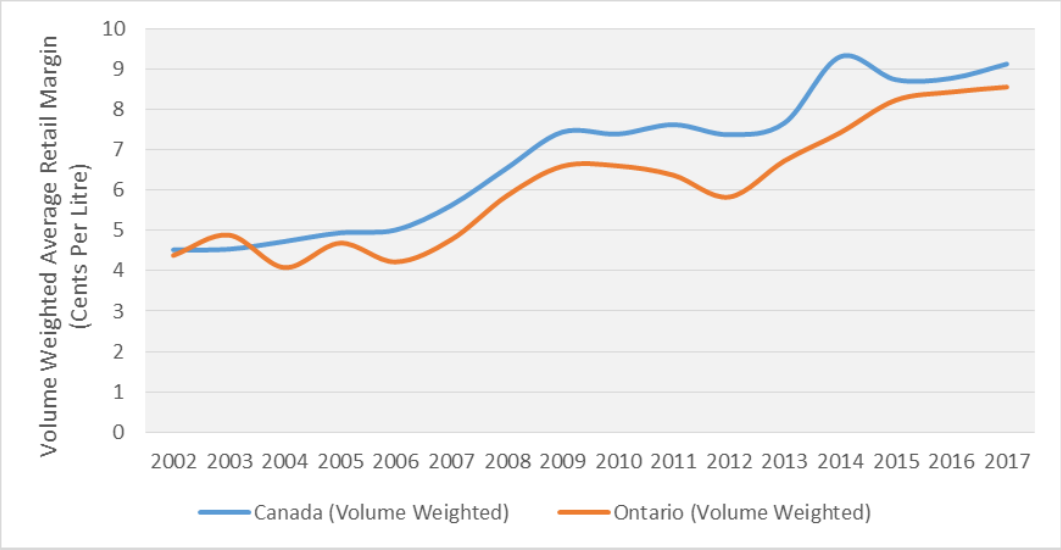
[30]Expressed here as the rack-to-retail margin for regular grade gasoline.

Between 1991 and 2014, the relative stagnation of retail margins was affected by several factors, including:

- Higher average gas station sales volumes (throughputs) due to outlet closures and modest demand growth;
- Substantial investment in ancillary offerings (such as convenience stores, car washes and quick-serve restaurants), leading to growth in ancillary revenue that augmented petroleum revenue; and
- Increased presence of "big-box" marketers, such as Costco.

The Canadian average retail margin reached 9.1 cents per litre in 2017 (Figure 26), the highest level recorded over the last 25 years. The Ontario average retail margin followed a similar upward trend, but tracked below the national average margin, reaching 8.6 cents per litre in 2017.

Figure 26: Canada vs Ontario Volume-Weighted Average Annual Retail Margins



Source: Kent, 2001-2017

This recent rise in retail margins can be attributed to a recent reversal of the effects from those same factors that kept retail margins low for nearly 25 years. This includes:

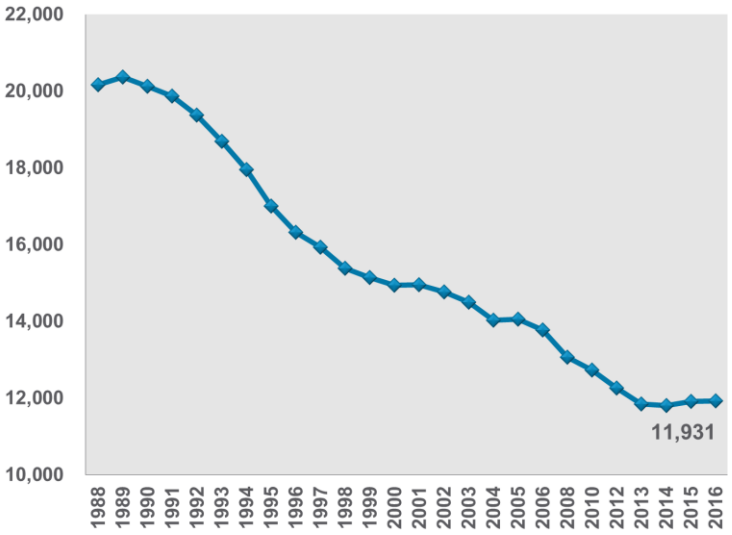
- A deceleration of Canadian site closures and stagnant gasoline demand, leading to slowed growth of average site throughputs. If retail sites sell less fuel, they may be pressured to realize more revenue through higher margins.
- The plateaued revenue growth from maturing investments in ancillary offerings, which may have led to retailers seeking more revenue from fuel sales.
- Slowed market penetration from big-box retailers, which may have led to less price-related pressure in some retail markets.

The following sections provide analysis of each of these factors.

The Impact of Changes in Outlet Population and Throughputs

Kent's retail site census established a national site count of 11,931 as of December 31st, 2016 – a small increase from the previous year - making this the second consecutive year to show an increase in retail site counts after annual declines for nearly 25 years.[31]

Figure 27: Canadian Retail Outlet Population



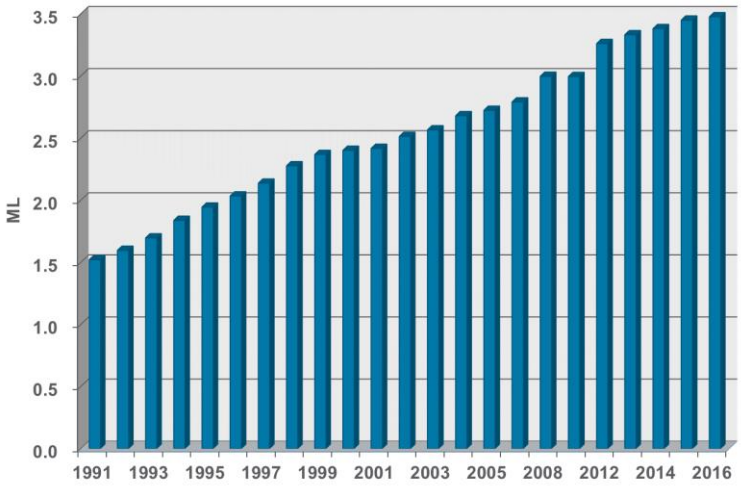
Source: Kent, 1988 - 2016

The Canadian retail gas station population peaked at about 20,360 in 1989, declining at a steady pace until 1999, and at a moderately slower pace through 2014, before moving higher in 2015. Over the last couple of years there were fewer site closures, causing the reversal of a longstanding trend.

While site counts from the last two years might be interpreted as a "bottoming out" of the long-term decline in the outlet population, it is likely premature to extrapolate that trend forward. Notwithstanding, it is probable that a sustained slowing in the rate of site closures is underway.

The change in outlet population has an impact on the average outlet's volume throughput, which in turn influences retail margins and pump prices. A retail outlet's fuel revenue is generated by its volume of sales multiplied by its fuel margin, requiring enough revenue to cover expenses and provide some level of return on investment. If a retailer sells more fuel (a rise in throughput) they require less margin on fuel to generate the same level of revenue, and are then afforded the opportunity to be more competitive

Figure 28: Canadian Average Site Throughputs



Source: Kent, million litres, 1991-2016

[31]The outlet counts for the period 1988-2003 are based on Octane Magazine's estimates.

on price, possibly capturing more volume from competitors.

Canadian throughputs improved dramatically in the past 25 years– a direct result of the retail outlet rationalizations shown in Figure 27, as well as increased demand. Higher outlet throughputs provided for improved fuel revenue potential, which in part, contributed to stagnant retail margins over most of that period.

Canadian average site throughputs doubled between 1991 and 2012, a compounded annual growth rate of 4 percent. Since 2012, the annualized rate of growth for average throughputs has slowed considerably, averaging just 1.5 percent, and rising just 0.6 percent in 2016. The change in Ontario's average throughputs has mirrored the national figures, growing an average of 1.6 percent since 2012, and rising just 0.7 percent in 2016.

The flattening of Ontario's average site throughputs was a primary contributor to the growth of average retail margins since 2012.

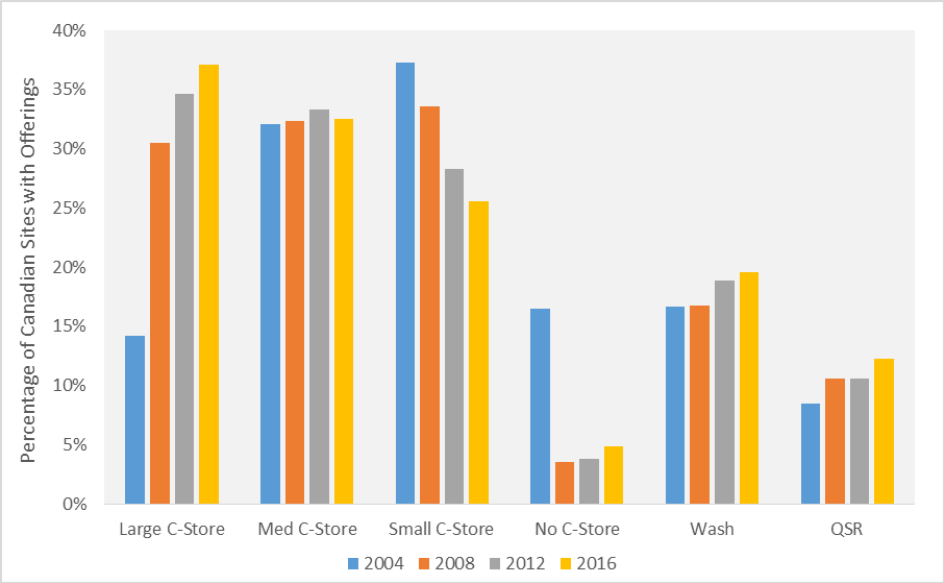
Changes in Contributions from Ancillary Offerings

Very few retail gasoline outlets limit their product offerings simply to transportation fuels. The revenue generated from ancillary goods and service offerings such as convenience stores, car washes, and quick serve restaurants is an increasingly essential element of retail fuels marketing, and to site viability.

The rise of ancillary offerings has had a profound effect on the retail fuel sector; the consequent improved outlet revenue from ancillary operations has contributed to reduced fuel margins. In effect, ancillary service offerings have subsidized fuel margins and lowered pump prices.

Figure 29 depicts the Canadian presence of several key ancillary offerings over the last 12 years. Many outlets have more than one ancillary offering: for example, outlets will often feature both a large-area convenience store and a modern car wash facility.

Figure 29: Percentage of Canadian Retail Fuel Sites by Ancillary Offer Type



Source: Kent, 2004 to 2016

The most significant changes in ancillary offerings since 2004 were the increased frequency of large convenience stores (from 14 percent to 37 percent of retail sites) and decreased frequency of small or no convenience offering (from a combined 51 percent to 30 percent). There were also small increases in the frequency of both carwash and quick-serve restaurants over the period.

Most ancillary services are operated by the retailer who may, under a marketer-controlled operation, compensate the marketer through a lease or franchise fee for the use of the retail space. Nevertheless, ancillary offerings provide some form of additional revenue to the party with price control regardless of mode of operation, and would effectively lower a site's needed fuel margin.

Of the various ancillary offerings, convenience stores produce the largest share of revenue contributions to retail sites. Figure 29 shows that large-scale investments were made into convenience stores between 2004 and 2008, and while those investments are still being made, their magnitude has diminished in each subsequent period. Many of these investments have likely matured, meaning that the growth in revenue from those investments is likely to have plateaued. This phenomenon is another factor that contributed to the rise in average retail margins since 2012.

Market Penetration for Big-Box Outlets

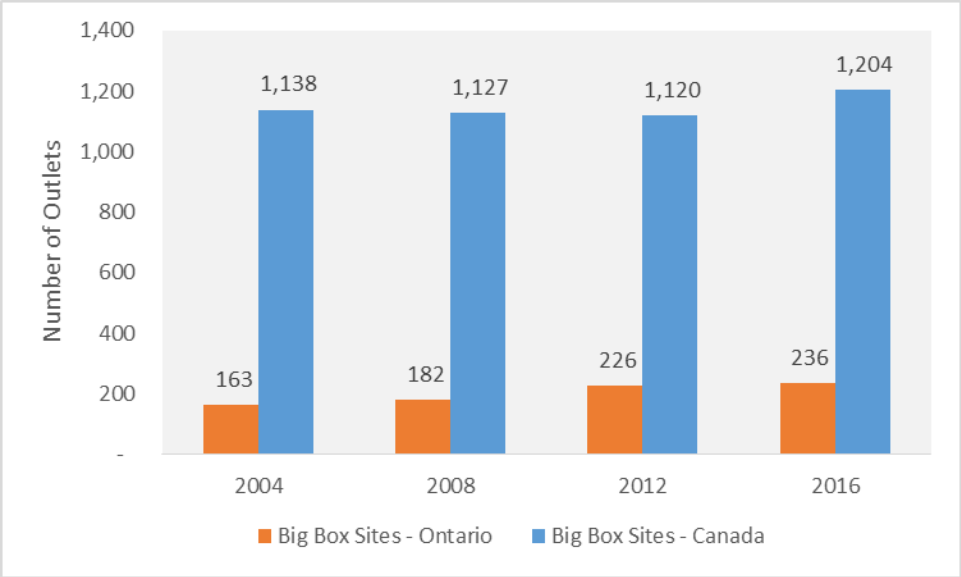
Big-box outlets are retail fuel sites that are generally defined by their co-location with large retail chain-stores (prominent examples in Ontario are Costco and Loblaws), and often have a disproportionate effect on retail fuel markets when compared to their relatively limited market share.

Most outlets in this category are high-volume retailers, meaning that their throughputs are much higher than market averages, in some cases four or five times that of an average retail site. This can give big-box retailers a pricing advantage over traditional retailers due to their relatively low operating costs per litre. This often means that markets with a significant big-box presence are characterized by lower average pump prices, and lower retail margins.

Big-box fuel marketers, particularly when entering a market, are often aggressively competitive with price, in some cases giving up their entire retail margin to promote the sale of memberships (Costco) or to entice new customers into the on-site retail store. As their penetration into a market slows, or their volume share levels-off, they generally adopt more sustainable pricing, usually resulting in a relative rise in that market's prices/margins.

Although the impact from big-box entry into the retail fuels market has been considerable over the last twenty years, their growth appears to be slowing. The number of big-box sites has risen only marginally since 2004, and in Ontario, increased by only 10 sites over the last four years. These types of outlets generally have large footprints, and require extensive catchment areas, and so their presence in most markets is relatively limited. It appears that in many Canadian markets, big-box players may be close to reaching a

Figure 30: Big-Box Outlet Counts in Canada and Ontario



Source: Kent, 2004-2016

saturation point, and this is another factor that has contributed to the growth of average retail margins since 2012.

Changes in Taxes on Transportation Fuels

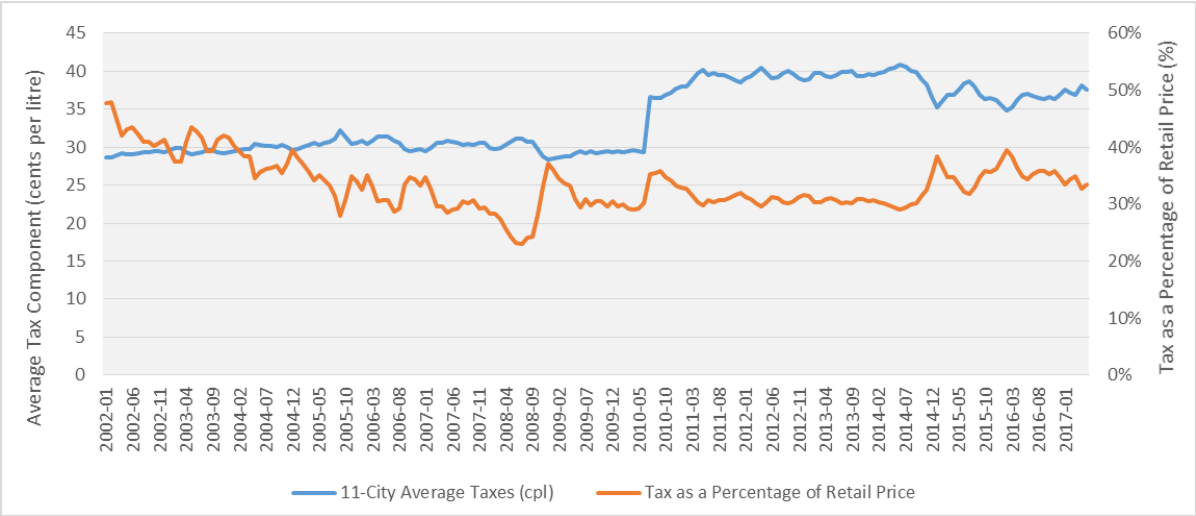
Taxes are currently the single largest component cost in pump prices; however, the tax portion of pump prices is fairly stable over time. While there is some tax variation in response to pump price movements, most appreciable changes occur when there is an adjustment to provincial fuel tax rates, a change to the handling of GST/HST, or more recently, the introduction of carbon tax or cap-and-trade legislation. Figure 31 shows Ontario's gasoline tax component since 2002, expressed both in cents per litre and as a percentage of the retail gasoline price.

One significant change in Ontario's motor fuel taxes since 2002 was the transition from GST to HST on July 1, 2010. The result of this change was a seven cent per litre increase in gasoline taxes.

More recently, Ontario introduced cap-and-trade legislation[32] that puts a price on carbon emissions, including emissions from gasoline and diesel. The price at the pump that is associated with cap and trade is market-based, and depends on the cap-and-trade emissions credit market pricing, but currently equates to roughly 4.3 cents per litre.[33] This amount is not accounted for in the fuel taxes presented in Figure 31, since cap-and-trade emissions credit prices are considered input costs that are built into rack prices.

[32]Cap-and-trade program began in January, 2017
[33]Pre-HST application.

Figure 31: Ontario Gasoline Taxes and Tax as Percentage of Gasoline Pump Prices



Source: Kent, 2002-2017

It is difficult to distinguish the amount of cap-and-trade cost that is passed-through to wholesale buyers, but if it were assumed to be 100 percent, it would effectively add about five cents per litre to Ontario's pump prices once HST is applied. This cap-and-trade cost would increase if the market price for emissions credits rises.

Section 7: Market Study - Why Pump Prices Can Differ Between Locations

Summary of Findings:

1. Intermarket price differences arise from a number of causes including: tax differences between distinct jurisdictions, rack price differences between supply regions, and retail margin differences between markets. In a 30-market sample of Canadian pump prices there was a 33 cent per litre difference between the highest and lowest average pump price in 2016.

2. Within Canada, there is significant disparity in fuel tax content by province; this accounts for a large portion of pump price differences between provinces.

3. Rack prices within a distinct region of supply do not vary much, yet between regions there can be fairly large differences in rack prices. Where there are differences between intra-regional rack prices (such as between Northern and Southern Ontario), they generally relate to the transportation costs associated with moving refined product from the refinery to the rack point.

4. While tax and rack price variances explain many of the intermarket pump price differences that exist across provincial boundaries, they do not account for pump price differences between markets within a province or between neighbouring cities. These pump price differences are largely explained by variances in retail margins.

5. Distribution costs are generally a function of the distance between the rack point and retail site, and can have the effect of increasing retail margins by the amount of this cost when this distance is greater.

6. Differences in average outlet throughputs have an effect on retail margins; on balance, markets with higher average throughputs exhibited lower average retail margins and vice versa.

7. Ancillary revenue is a critical factor in enabling some retailers to be more price-competitive. In our sample of 65 markets, the average retail margin for markets that had above average ancillary revenue was 0.7 cents per litre lower than those with below average ancillary revenue.

8. In our 65-market sample, markets with a big-box presence had an average retail margin that was 2.8 cents per litre lower than markets that had no big-box presence.

9. Despite the negative connotations that some consumers attach to price volatility, markets that exhibit more volatility generally have lower retail margins and pump prices.

10. Kent's model showed that Ontario's 2016 retail margins and pump prices were rational given each market's characteristics. Ontario markets exhibited competitive price behaviour, and their prices were shown to be heavily influenced by the factors outlined in this report.

Intermarket Price Differences: Causes and Factors

The previous section examined factors that explain pump price movements over time; this section, identifies and explains the factors that can cause pump prices to differ between markets, regions, provinces, and countries.

Geographic price disparities are referred to here as intermarket price differences. Figure 32 shows the average pump price (by component) for 30 Canadian markets; there was a 33 cent per litre differential between the highest and lowest prices in 2016.[34] This figure illustrates the range of component prices and margins by market, and their contribution to pump price variances.

In our experience, intermarket price differences arise from a number of causes and can be influenced by a number of factors including:

- Taxes – distinct tax jurisdictions often have different fuel tax rates that can lead to significant pump price variances.

- Rack price differences – wholesale prices are generally competitive within an area of logistically connected supply (between markets connected by a refined products pipeline, for instance), but can differ considerably between regions that are not connected by logistical infrastructure.

- Differences in retail margins – retail margins can vary substantially, even at a local level, and this is often a primary contributor to pump price differences between markets within a province. There are a number factors that are known to affect retail fuel margins:

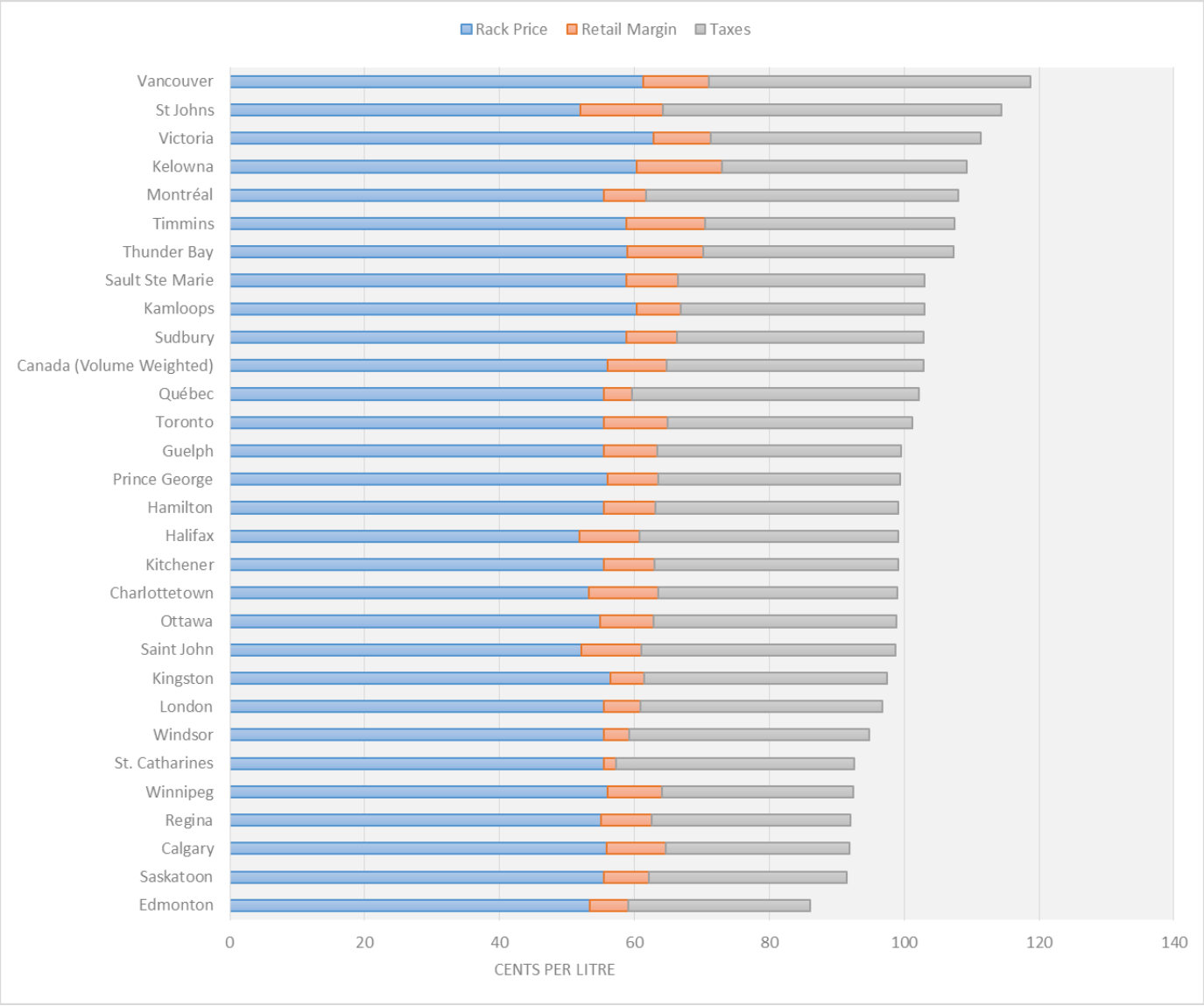
    - Supply and Distribution Costs;
    - Outlet Throughputs;
    - Ancillary Revenue;

[34]There was a standard deviation of 7.2 cents per litre to the mean pump price – this is a common statistical measure of variation or dispersion in a dataset.

- The Presence of Big-Box Marketers; and
- Competition and Price Volatility.

Each of these factors, and their link to intermarket price differences, is discussed in the following sections.

Figure 32: 2016 Average Retail Gasoline Price Components

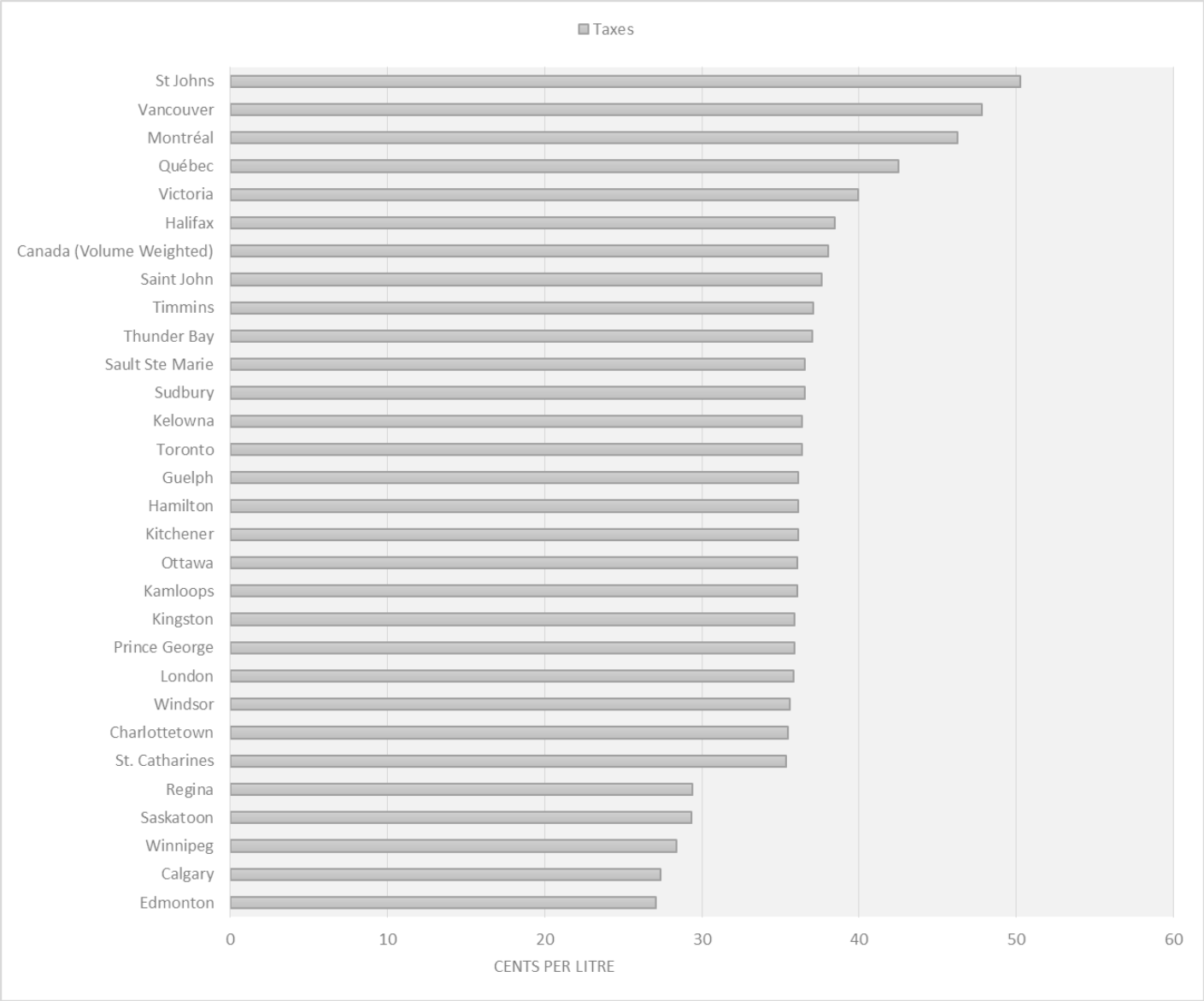


Source: Kent, from 30 Canadian Markets

Taxes

Within Canada, there is significant disparity in fuel tax content by province, which accounts for a large portion of the pump price differences between provinces. Figure 33 shows the range of average fuel taxes in the same group of 30 Canadian markets, and there was a 23 cent per litre differential between the highest and lowest fuel tax amounts.

Figure 33: 2016 Canadian Gasoline Taxes



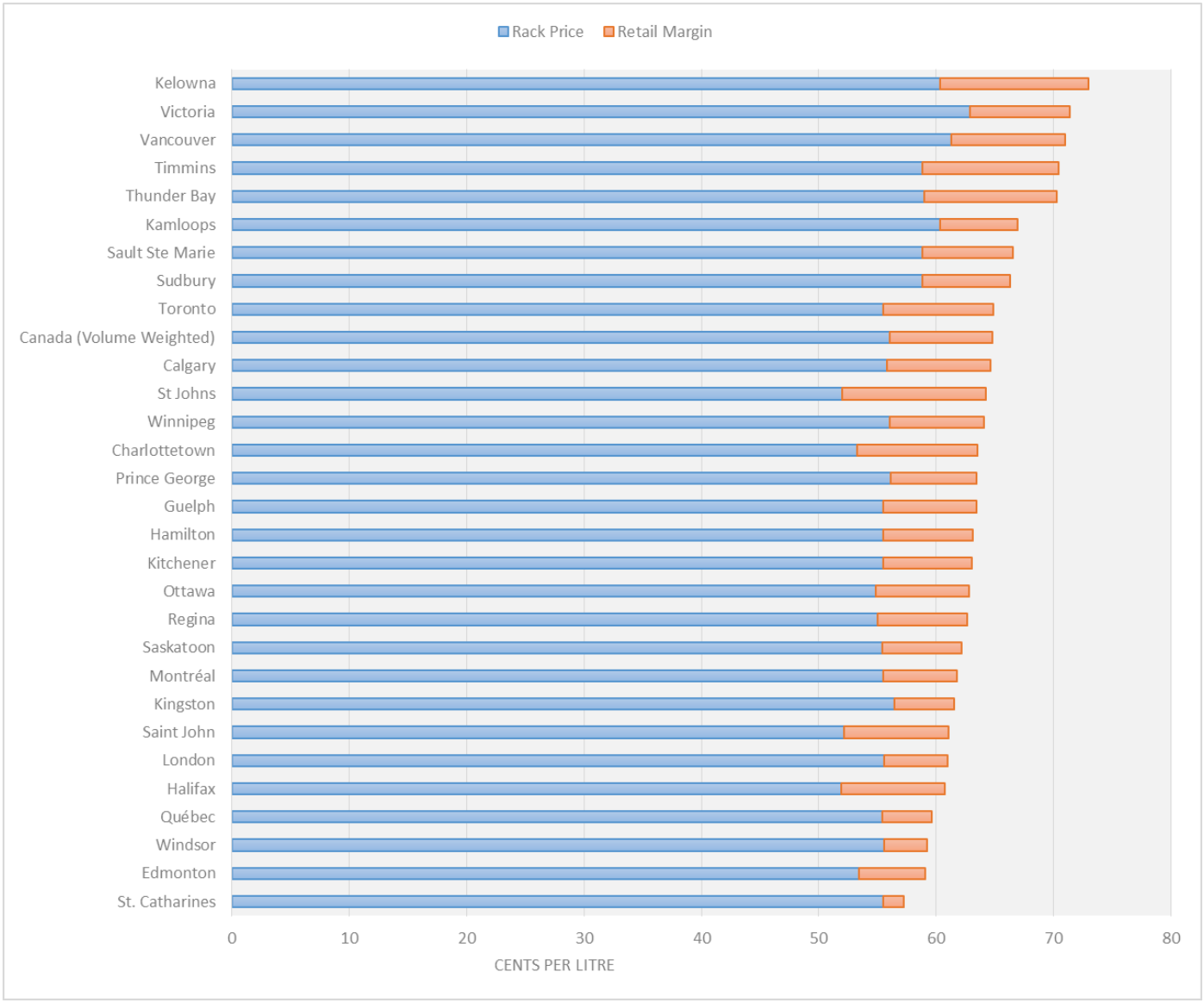
Source: Kent, from 30 Canadian markets

Once gasoline taxes were removed from pump prices, the variances between the ex-tax prices were much smaller (Figure 34). There was a differential of only 15.8 cents per litre between the highest and the lowest average ex-tax prices among the sample of Canadian markets.[35]

In addition, taxation rates explain much of the variance between Canadian and U.S. pump prices. Despite large differences between Canadian and U.S. pump prices, their relative

[35] Exhibiting a standard deviation of 3.9 cents per litre from the mean, roughly half of what it was for pump prices with taxes included.

Figure 34: 2016 Canadian Ex-Tax Gasoline Prices (by Component)



Source: Kent, from 30 Canadian markets

prices become far more similar when compared on an ex-tax and exchange-adjusted basis.

Rack Price Differences

Wholesale markets are typically defined regionally, where petroleum refiners compete to sell refined products to retail marketing organizations. The boundaries of these wholesale markets are typically established by supply infrastructure; for competition to take place there must be an available mode of transportation to move refined product from one area to another. These regional wholesale markets are often referred to as supply orbits.

There are four distinct supply orbits within Canada:

- **The West Coast** – this includes the Lower Mainland of BC, as well as Vancouver Island. Over the last few years, this region has also had more influence on pricing further inland towards the Okanagan Valley (Kelowna and Kamloops). This region's supply is made up of domestic production (primarily via the Burnaby refinery), refined products shipped into the region via the Trans-Mountain pipeline from Edmonton, and imports into the coastal Lower Mainland. Over the last couple of years, wholesale pricing in this region has been heavily influenced by the price of imports from the U.S. West Coast; this is primarily a result of the pipeline from Edmonton being under apportionment (full) and limited production capacity at BC refineries.

- **Western Canada** – this supply orbit stretches from the inland markets of BC as far east as Thunder Bay, Ontario. This region is tied together by a network of refined product pipelines that originate near Edmonton, carrying product west to the coast, and east into Winnipeg where it can then be railed or trucked as far as Thunder Bay. Rack prices throughout this region typically follow movements in Edmonton rack prices, and are heavily influenced by wholesale gasoline markets in the U.S. Midwest.

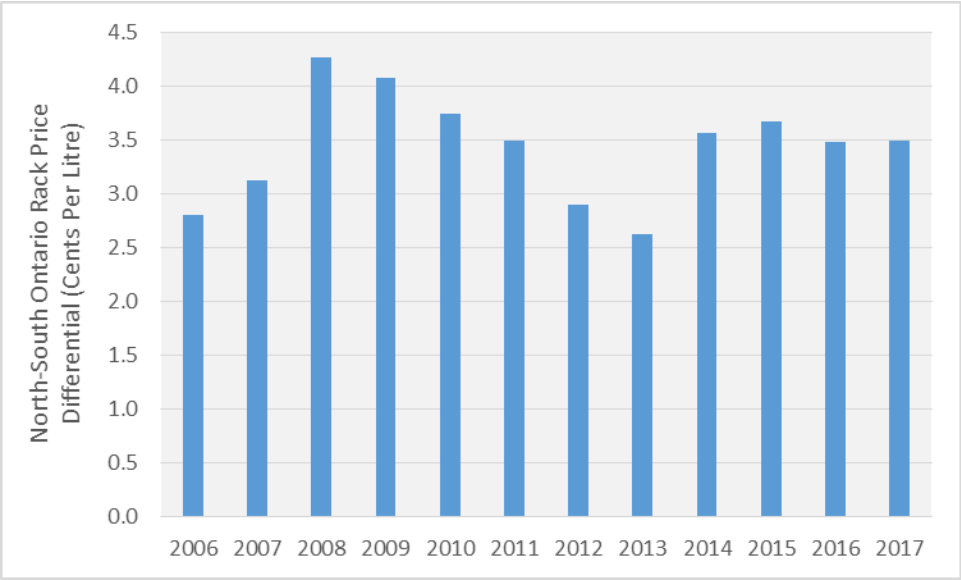
- **Ontario and Quebec** – this includes most of Ontario and reaches east to Montreal. There is a network of pipelines that carries refined products from facilities in Sarnia and Nanticoke towards the Toronto area, and another set of pipelines that carry refined products west from Montreal into the Toronto area. Other regions within this orbit, such as Northern Ontario, are not serviced by pipelines; their terminals are supplied via ship, rail, or sometimes tanker truck, which incurs additional transportation costs, and increases their rack prices relative to the southern part of the province. Prices throughout this region typically follow the day-to-day price movements of the Toronto area, and the region is generally influenced by the New York Harbor spot market.

- **Atlantic Canada** – this supply orbit extends from Quebec City to the East Coast, and is unique in that most of its major supply points are accessible by ship or barge. Supply in this region comes from the production of regional refineries and imports. Rack prices in this region are typically uniform, and are heavily influenced by the New York Harbor spot market, and occasionally affected by import pricing from the U.S. or Europe.

Rack prices within these regions do not vary much, yet between regions there can be fairly large differences in rack prices - these are illustrated in Figure 34. There was an 11 cent per litre differential between the highest and lowest rack prices among these Canadian markets in 2016, and there was distinct stratification of rack prices by supply region. West Coast markets had the highest rack prices in 2016, followed closely by Northern Ontario markets, then the rest of Ontario, Quebec and Western Canada, and lastly Atlantic markets which posted the lowest rack prices in 2016.

Substantial differences between rack prices within a supply region are generally due to the transportation costs associated with moving refined product from its point of production (refinery) to its point of primary distribution (terminal or rack point).

Figure 35: Average Rack Price Differential between Northern and Southern Ontario Markets



Source: Kent, 2006-2017

Rack prices in Northern Ontario are consistently higher than in Southern Ontario, because terminal locations in the North are hundreds of kilometers from refinery production and there are no pipelines[36] to transport gasoline and diesel into the region. Terminals or bulk plants in Northern Ontario are primarily supplied by rail or truck, [37] which are more costly modes of transportation and contribute to higher regional rack prices when compared to other parts of the province. In 2016, Northern Ontario rack prices averaged 3.5 cents per litre higher than in Southern Ontario, and this differential has been fairly consistent since 2014 (Figure 35).

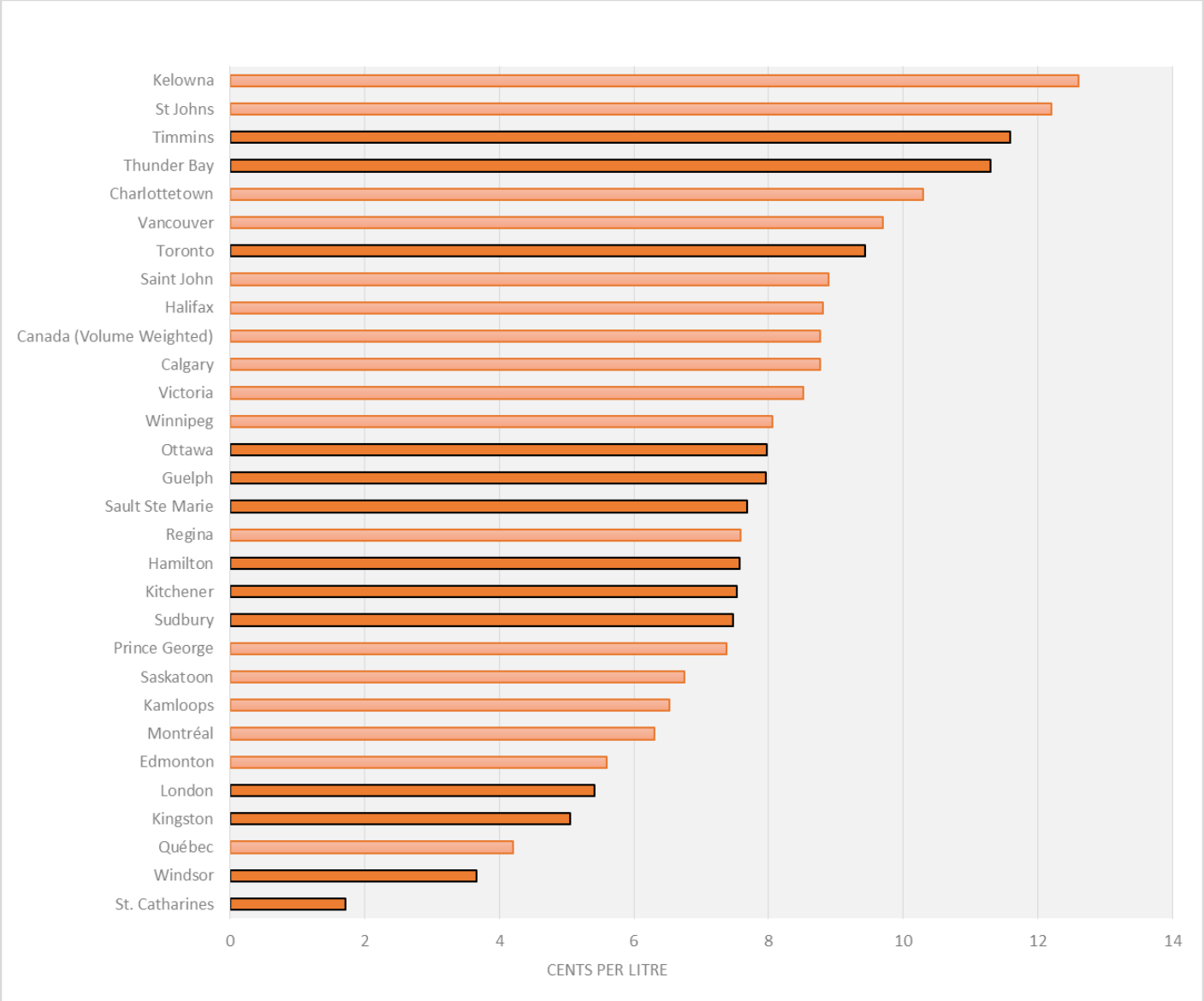
Thunder Bay and its nearby communities have a unique dynamic in that they can receive supply from both Western Canada (via rail or tanker truck) and from Ontario (via marine access); its source often shifts on a seasonal basis. For most of the year, Thunder Bay has the flexibility to acquire supply at the lowest cost from either region, but in the winter months, when the Great Lakes can freeze, the market is often forced to shift to western supply. Depending on the present rack price disparity between Edmonton and Toronto[38], this can mean higher relative prices in that specific region.

Once rack price and tax differentials are removed from pump prices, this leaves only retail margins as a source for intermarket price differences (Figure 36). While retail margin

[36]The most cost effective way to transport refined products over long distances on land.
[37] Some markets, like Thunder Bay, can be supplied by marine transport.
[38]Which can sometimes differ by ten cents per litre or more.

variances are small compared to tax variances, their disparity can still produce sizeable intermarket price differences.

Figure 36: 2016 Canadian Retail Margins on Gasoline



Source: Kent, from 30 Canadian markets – Ontario markets highlighted

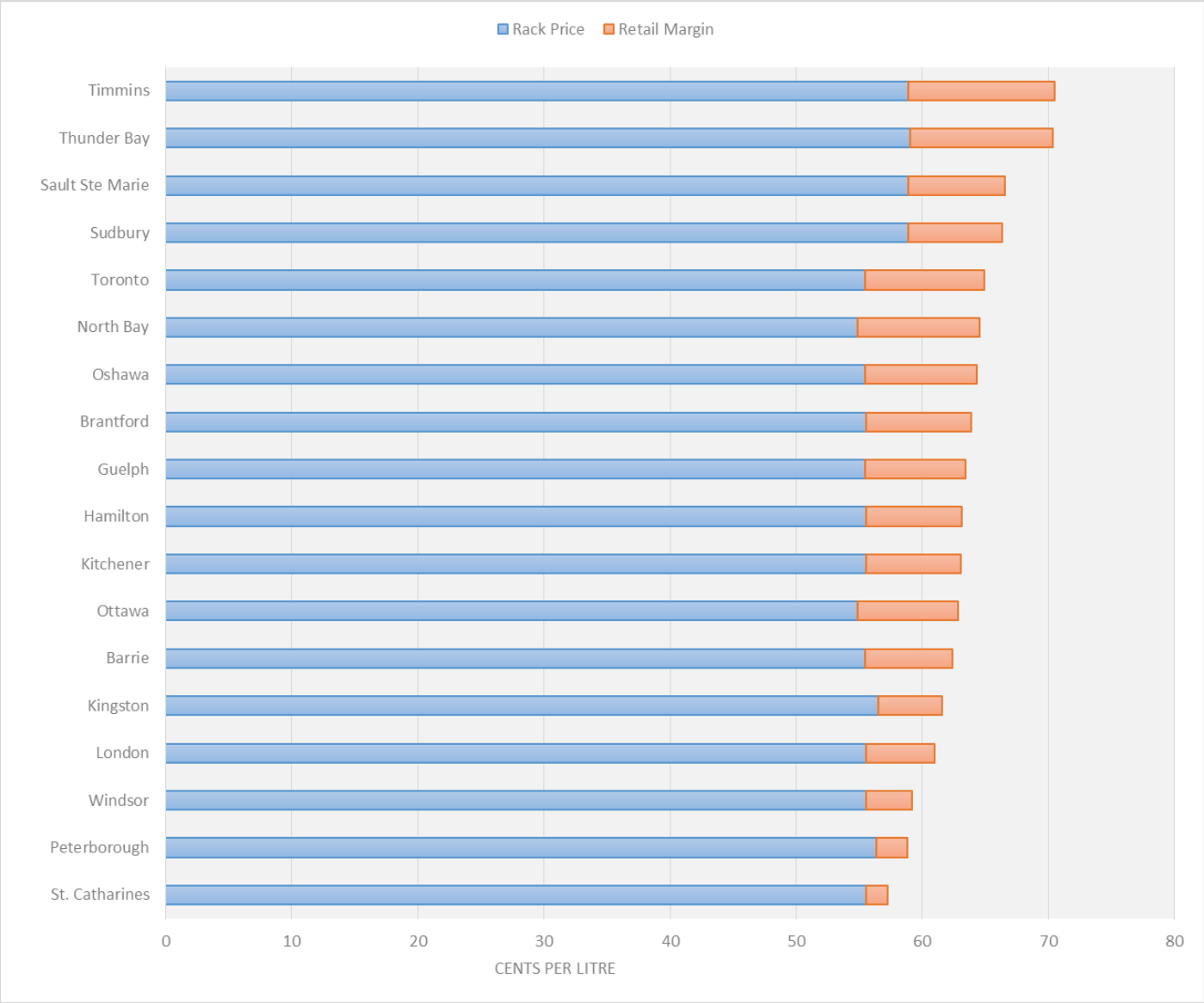
Retail Margin Differences

The tax and rack price variances discussed in the previous sections explain many of the intermarket pump price differences that exist across provincial boundaries, but they do not account for pump price differences between markets within a province, or even price differences between neighbouring cities.

Retail markets tend to be defined locally, where retailers compete with other nearby retailers to sell transportation fuels to consumers. Accordingly, nearby but separate markets can exhibit distinctive pricing dynamics and pump prices.

Pump price differences between markets within a province are largely explained by variances in retail margins, and are affected by the factors that cause retail margins to rise or fall. Figure 37 shows a breakdown of the ex-tax retail prices for 18 Ontario markets in 2016, and besides minor variances in their rack prices, retail margins were clearly the predominant driver of their intermarket price differences. There was a 10 cent per litre difference between the highest and lowest retail margins in these Ontario markets.

Figure 37: Retail 2016 Ex-Tax Prices (by Component) in Ontario



Source: Kent

There are a number of factors that are known to influence retail margins including:

- Freight and distribution costs;
- Retail outlet throughputs;
- Revenue generated from Ancillary offerings;
- The presence of big-box retailers; and
- Price competition and volatility.

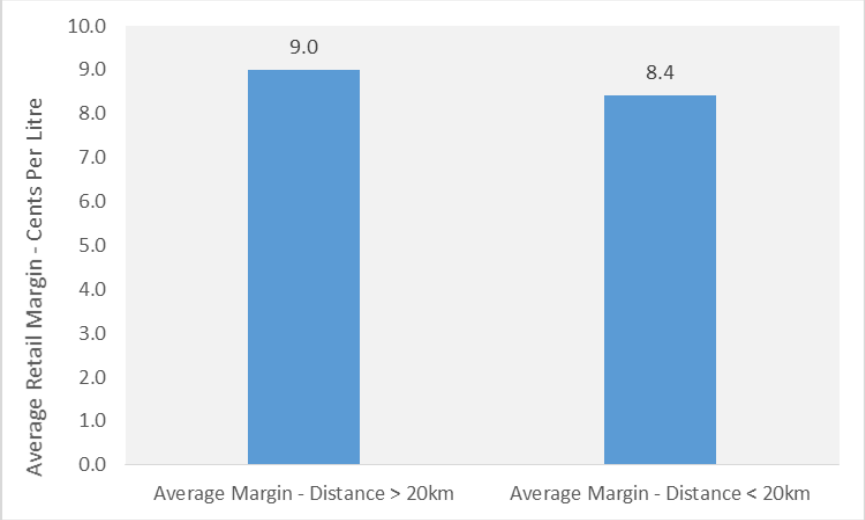
The following section will discuss the effect of each of these factors on retail margins and intermarket price differences.

Freight and Distribution Costs

Distribution costs relating to the transport of gasoline from the wholesale rack to the retail site are borne by the retailer, and are included in the calculation of a rack-to-retail margin. These costs are relatively stable, and generally a function of the distance between the rack point and the site. Many urban markets have rack points within the city and so their distribution costs are relatively low – typically fractions of a cent (0.2 – 0.5 cents per litre).

Some markets do not have a primary terminal nearby, and will either truck product in from a more distant terminal, or in some cases, get product from a bulk plant operation.[39] Either of these approaches would add distribution costs for the retailer.

Figure 38: Average 2016 Retail Margin by Distance from Primary Terminal



Source: Kent, 65 Canadian markets

[39] A facility that would truck in bulk product from a distant primary terminal, store it, and re-distribute to local stations.

In a sample of 65 Canadian markets,[40] roughly half of the markets were within 20 kilometers of a primary terminal (indicating that there was a terminal within the market). The markets that were beyond 20 kilometers[41] from a primary terminal had average retail margins that were 0.6 cents per litre higher than those within 20 kilometers, while those beyond 100 kilometers had average retail margins that were 1.2 cents per litre higher than those within 20 kilometers.

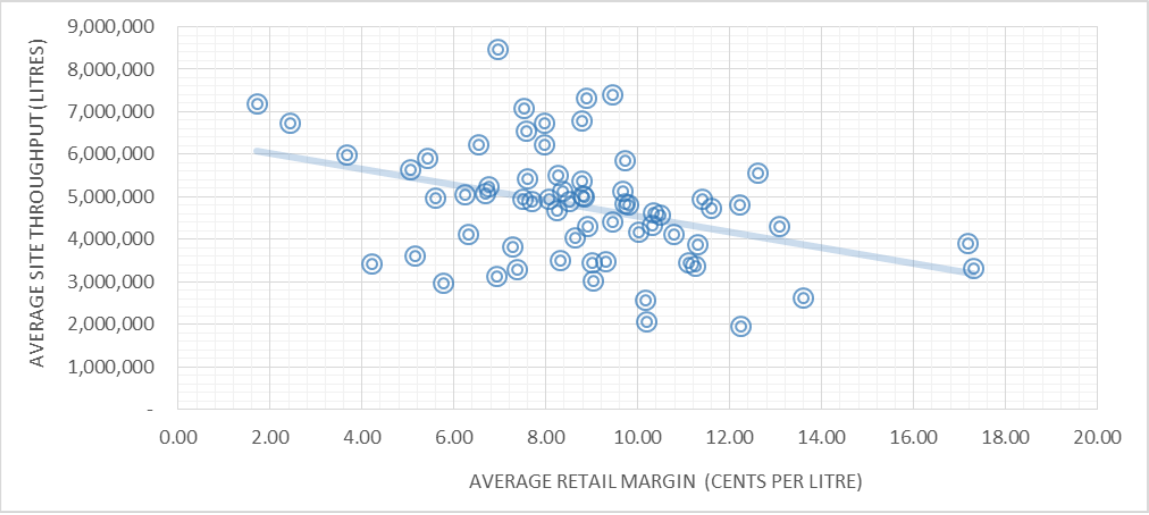
While freight and distribution costs appear to have an effect on retail margins, that effect is relatively small.

Retail Outlet Throughput

Gas stations with higher sales volumes incur lower operating cost per litre, thus enabling them to either be more profitable, to be more price-competitive, or both. It follows that markets with higher average throughputs are more likely to have lower retail margins than those with lower average throughputs.

Average outlet throughput can vary widely by market. Based on the sample of 65 Canadian markets in this study, average annual throughputs ranged from under two million litres in smaller population centres, to roughly eight million litres in markets around the Greater Toronto Area.

Figure 39: 2016 Average Outlet Throughput vs Average Retail Margin



Source: Kent, 65 Canadian markets

Ontario gas stations had the highest average throughputs of any province in our sample, at 6.8 million litres of fuel annually, while Newfoundland had one of the lowest average

[40] 18 of those markets are in Ontario.
[41] The average distance to the primary rack for these markets was 120km.

throughputs, at roughly 4 million litres annually. This disparity in throughputs contributed to retail margins in Newfoundland that were 1.9 times higher than in Ontario.

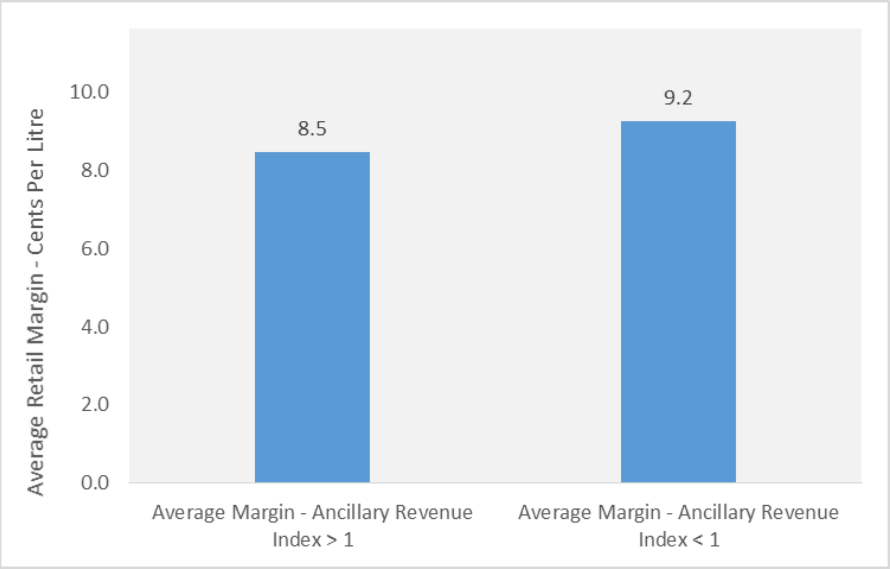
Figure 39 plots the average throughputs of the 65 Canadian markets in our sample against their average retail margin for 2016, and it shows that a distinct relationship exists between the two variables. On balance, markets with higher average throughputs exhibited lower average retail margins and vice versa.

While there is a relationship between these variables, it does not fully explain some of the margin differences between markets in the sample.[42] There are other variables that are influencing margins in those "outlier" markets.

Ancillary Revenue

Like outlet throughput, ancillary revenue works to effectively lower a retail site's fuel margin requirements. It is a critical factor in enabling some retailers to be more price-competitive: by essentially subsidizing fuel margins, it allows the retailer to lower pump prices and to try to generate more traffic to the pumps or into the store.

Figure 40: Average 2016 Retail Margin by Relative level of Ancillary Revenue



Source: Kent, 65 Canadian markets

In our sample of 65 markets, the average retail margin in markets that had above average ancillary revenue[43] was 0.7 cents per litre lower than those with below average ancillary revenue generation (Figure 40). This finding supports our view that higher ancillary

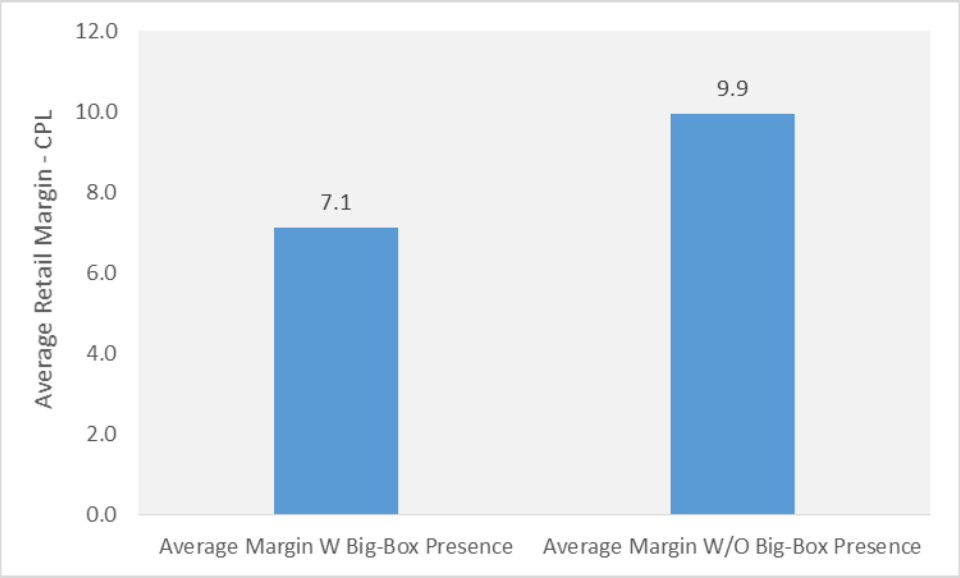
[42] Meaning there are a number of outliers to the trend line established in Figure 39.
[43]This data was obtained from Kent's Retail Operations Benchmarking database, using data from 2013 (the last available year in our database). In our experience the ratios of ancillary revenues between markets would not vary much from year-to-year.

revenue allows retailers to be more competitive with pump prices, thus lowering retail margins.

The Presence of Big-Box Marketers

As previously described, many big-box operators have an operating cost advantage they can use to price more competitively, sometimes forgoing margin to promote membership sales and to increase traffic into the on-site main store. These stores often have a market-wide price and margin impact that is disproportionate to their relatively small market share.

Figure 41: Average 2016 Retail Margin based on the Presence of Big-Box Operators



Source: Kent, 65 Canadian markets

In the 65-market sample, there was a big-box presence[44] in 28 markets, and those markets had average retail margins that were 2.8 cents per litre below markets that did not have big-box presence.

Price Volatility and Competition in Retail Markets

While all of the abovementioned factors have a measurable impact on retail margins, one of the most reliable indicators of retail margin levels is price volatility. Despite the negative connotations that some consumers attach to price volatility, this section shows that it can be indicative of competitive price behaviour, and markets that exhibit more volatility generally have lower relative retail margins and pump prices.

[44]For the purposes of this assessment, this was defined by the presence of a Costco, which typically has the most impact on market-wide prices and margins.

In order to address the competitiveness of pump prices, one must ask *how* marketers compete. Simply put, competitive activity can be observed when a competitor alters one or more of the variables at their disposal, commonly known as the four P's of marketing: Product, Price, Place, and Promotion.

In most markets, gasoline is viewed by consumers as a commodity - uniform in quality and widely available. As such, price has proven to be the most widely used competitive tool by gasoline marketers. Some of the dynamics of price competition are:

- Prominently displayed prices - pump prices are almost universally displayed on highly visible outlet signs, and this indicates the importance of price as a key selling feature.
- Volatile prices - fluctuating pump prices are an indicator of robust competition among marketers. Volatile pricing often manifests itself in the form of price wars.
- Uniform prices - while uniform pump prices are sometimes cited as evidence of collusion, it can be another indicator of competitive price activity and confirmation of the prevailing view of gasoline as a commodity.
- Low prices and margins - Inevitably, the result of price competition is reduced margin, as competitors seek to attract market share through lower prices.

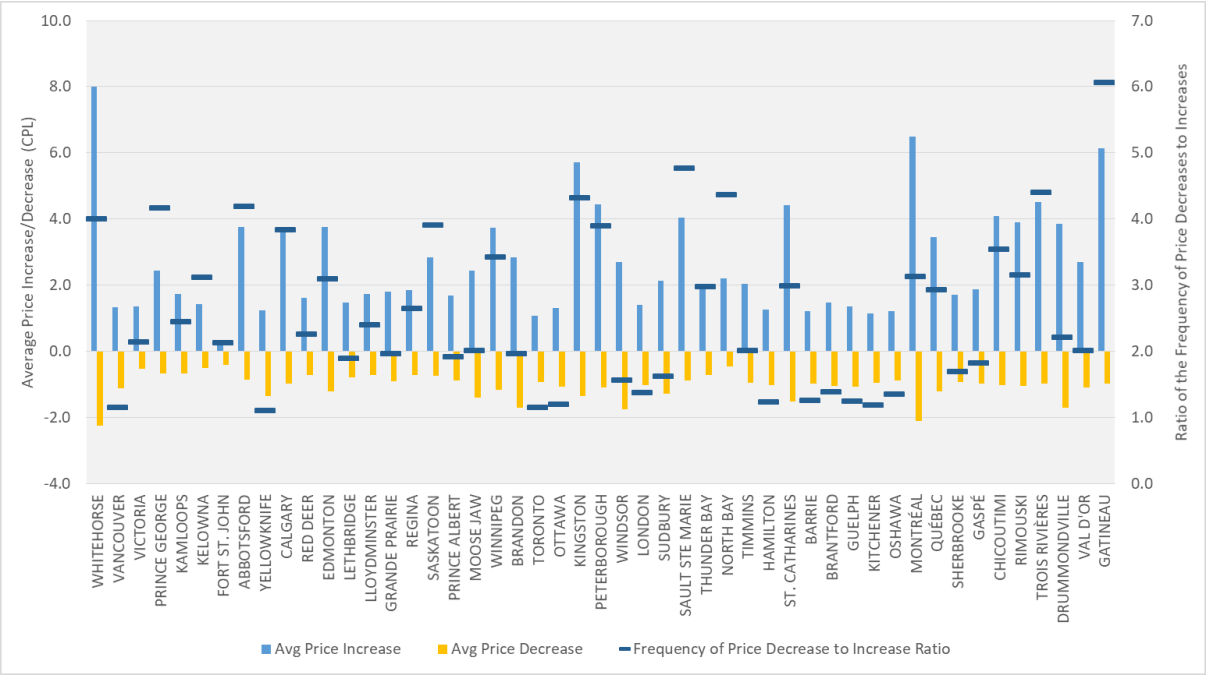
While competitive pricing can take many forms, there are some commonly observed pricing behaviours that are known to be indicative of competition. Figure 43 presents a commonly cited fuel pricing phenomenon known as "rockets and feathers," which means that pump prices often rise quickly (like a rocket), and fall more gradually (like a feather).

This phenomenon results from consumers' general sensitivity to price, and retailers' use of price as a lever to attract customers. The observed effects of this pricing behaviour are smaller, more frequent decreases in price as competitors sacrifice margin to generate sales, and larger, less frequent price increases to restore sustainable margins.

Kent analyzed daily price movements in the 65-market sample, and this phenomenon was commonly observed among the 49 non-regulated markets.[45] In that subset of markets the average price increase was 2.6 cents per litre, while the average price decrease was only 1.0 cent per litre; however, prices fell 2.2 times more frequently than they rose. (Figure 42).

[45]In this case, the Atlantic Provinces were excluded since their price regulations have altered the pricing behaviour in those markets. These provinces will be reviewed in more detail in a later section of this report on price regulations. Quebec, which has price regulations, was kept in the sample since its specific regulations were found to have little impact on pricing behaviour.

Figure 42: The Magnitude and Frequency of Price Increases and Decreases

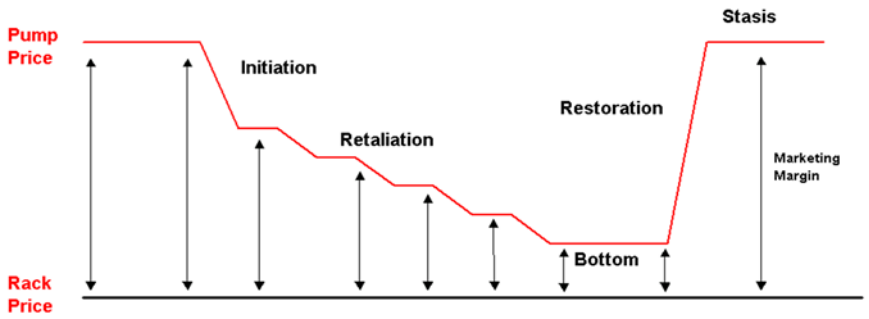


Source: Kent, based on daily price data in 49 markets, 2016 and 2017

One clear outcome of this type of competitive pricing behaviour is volatility, which refers to the degree which prices rise or fall over a period of time. When market prices change frequently, the market is said to have high volatility, and when relatively stable prices prevail, the market is said to have low volatility. In this report, volatility is expressed as a percentage;[46] higher percentages mean more volatility in a market's price movement.

Volatility can sometimes take the form of a "price war" (Figure 43). After a competitor first lowers their price (initiation) in an attempt to gain market share, other competitors often

Figure 43: Common Competitive Price War Behaviour: "Rockets and Feathers"



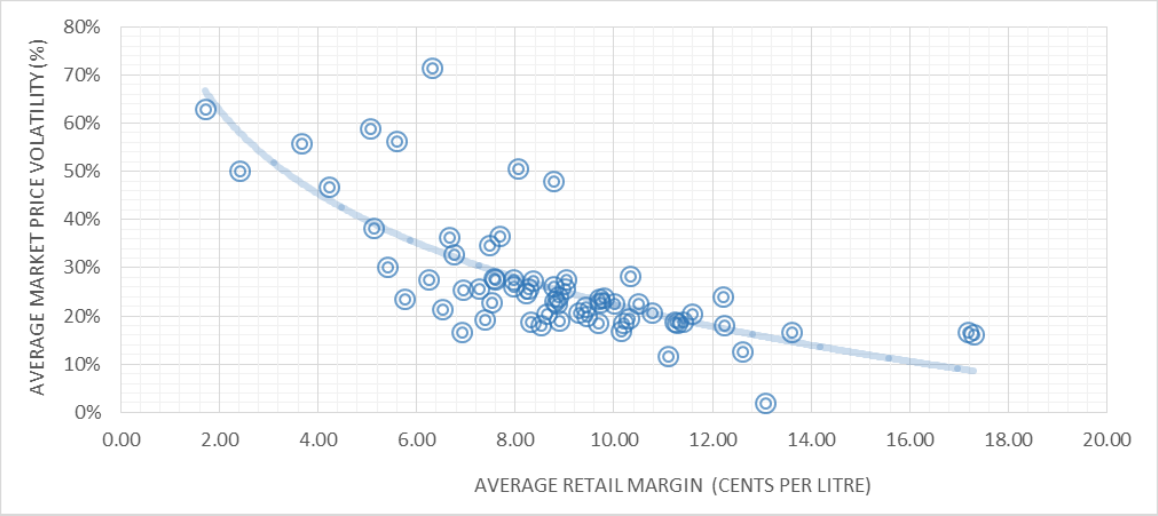
[46] This percentage represents the annualized standard deviation of daily price movements.

respond by lowering their price and potentially undercutting the other competitors to maintain market share (retaliation). The effect of this upon the retail margin is obvious: it is squeezed, possibly to a point of being insufficient to cover operating costs. If retail margins shrink to a point that is not viable for most competitors (bottom), one or more of those competitors may be forced to make a difficult decision: to be the first to raise pump prices and restore viable margins (restoration).

If the resulting retail price increase is too high, competitors may not follow, in an attempt to gain market share. But if the pump price increase is a reasonable reflection of the underlying retail margin need, competitors will likely match this price, since they too may be eager to restore their margins to sustainable levels.

Some consumers view volatility as a negative pricing trait, often conflating it with price manipulation; volatile markets are often associated with lower relative prices and retail margins, however. Figure 44 illustrates the relationship between a market's price volatility and its retail margin;[47] the markets exhibiting higher volatility generally had lower retail margins.

Figure 44: Average Market Price Volatility vs Average Retail Margin



Source: Kent, based on 65 Canadian markets from 2016

Similar to price volatility, price uniformity between competitors is often perceived as anti-competitive, sometimes cited as evidence that marketers engage in direct communication to "fix" prices at an agreed-to level. This is also a misconception.

To understand the phenomenon of uniform pump prices, one must adopt the perspectives of both consumers and competing, adjacent retailers. If one retailer decides to reduce pump prices (by two cents, for example), the effect on many consumers is immediate: they will drive into *that* station, bypassing the higher-priced outlet. The other retailer has little choice but to quickly match, or even undercut the competitor's lower price, in order

[47] These two variables show a very strong negative correlation (-0.7).

to maintain market share. Pump prices therefore often move uniformly within a very short time.

A common feature in competitive price behaviour between retailers is the posted price sign: it is this feature that instantaneously communicates pump prices, not only to consumers, but to competitors, who can then quickly react to the change. The introduction of online price tracking services like GasBuddy make retail pricing even more visible and provide additional tools for consumers and retailers to monitor pricing among competitive sites.

The issue of price volatility – and the question of its consequence for consumers – has received some attention in the last few years. David Byrne and Roger Ware published research papers in the 2011[48] and 2012[49] on the phenomenon of "price cycling"[50], price coordination, and price leadership with a focus on Ontario's retail gasoline markets. Their research was based primarily on data from 110 markets from mid-2007 to mid-2008, and looked specifically at characterizing pricing dynamics by studying the price movement between competitive sites within a market (typically grouped by brand in the findings).

The authors concluded that there was a relationship between the size and concentration (with respect to brand presence) of the market, and the presence of price cycling behaviour. They also concluded that within "cycling" markets, refiner-branded sites led price increases through coordinated pricing (coordinated within a brand, not between brands), while non-refiner brands (independent brands) more aggressively undercut prices over the cycle.

Generally speaking, Byrne and Ware's research focused on brand-specific pricing tactics between competitive sites within a market (or "micro-level"), and is beyond the scope of this report. Our focus is primarily on price changes at the market-average level (or "macro-level"), and particularly the way this helps explain intermarket price differences.

Nevertheless, it is important to note that Byrne and Ware's research did not differentiate between brand and marketer at retail sites, and never identified the party that had control over price setting. Their conclusions rested on the assumption that there were always homogenous and coordinated control over pricing within a branded network in a given market. However, as was shown in Section 4, homogenous and coordinated control of branded networks is rare, and has become even less common since the authors' research was conducted. For example, by year-end 2016, there were eight distinct companies marketing the Esso brand within the Greater Toronto Area,[51] and eight distinct companies marketing the Shell brand across Ontario, and that does not consider the number of sites within those companies that may operate as non-controlled outlets (meaning each

[48]Byrne, D. and Ware, R. (2011) *Price Cycles and Price Leadership in Gasoline Markets: New Evidence from Canada* (Research Paper No. 1124). The University of Melbourne: Department of Economics.
[49]Byrne, D. (2012) *Petrol Price Cycles* (Research Paper No. 1159). The University of Melbourne: Department of Economics.
[50] Comparable to the example of "Rockets and Feathers" discussed above.
[51] None were marketed or had their prices set by the brand owner, Imperial Oil.

individual retailer sets the pump price). There is more diversity in price-control than the findings of their study assume. It is unlikely that the same conclusions could be drawn from a similar study that considered price-control dynamics within branded networks, or was conducted under the current make-up of Ontario's retail fuel market.

Retail Margin Model: The Combined Effect of Factors on Retail Margins

Each factor discussed in the previous section does not, by itself, explain retail margin differences; it is in combination that these factors influence a market's retail margin. Kent created a model to measure the relative effect of each of the listed factors when applied together, and this (regression) model was used to evaluate the impact of these variables on retail margins in Ontario.

Multiple linear regression (MLR) is a statistical technique that uses a number of explanatory (independent) variables to predict the outcome of a dependent variable. The objective of MLR is to model the relationship between the factors affecting margins (explanatory variables) and retail margins (outcome variable). In this case, we used 2016 retail margin data from 65 Canadian markets as well as:

- 2016 average annual volume throughput for each of the 65 markets, taken from Kent's volumetric database.
- A designation identifying the presence of a big-box location in each of the 65 markets (we used Costco presence as the proxy for this as they have the most significant price and margin impacts).
- A standard measure of price volatility based on the day-to-day price movements in each of the 65 markets. Volatility is expressed here as a percentage, and higher percentages mean more volatile pricing. This was, by a wide margin, the best predictor of retail margin levels in our model.
- A measure of the average road-distance to the nearest primary terminal rack point for each of the 65 markets – this is meant to account for differences in freight and distribution costs for each market.
- An indexed measure of ancillary revenue for each of the 65 markets – we averaged ancillary revenue performance across the 65 markets and created an index of relative performance. A market with a number greater than one is generating above average revenue, and below one is generating below average revenue. In the final model, this variable was removed due high correlation with other variables, and the introduction of some "statistical noise" into the model.

Modelling Retail Margin Differences in Ontario

Using Kent's MLR model, the independent variables were mapped for 2016 and the results for each Ontario market is presented in Table 2. We also provided a comparison of the results from the model against the actual margins in each of the markets over that same period.

The accuracy of the margin predictions is critical in establishing the strength of the relationship between these combined factors and the resulting retail margin.

It is clear that the factors used in the model sufficiently explained the differences in Ontario's retail margins.[52] The model's results were statistically significant[53], and can be interpreted to mean that most of the variation in Ontario's 2016 retail margins (roughly 87 percent) can be explained by the set of factors included in the model.

The model's average predicted margins differed from actual margins by an average of 0.71 cents per litre, and no predictions were more than 1.6 cents per litre away from the actual. Despite the 10 cent per litre gap between Ontario's highest and lowest retail margin in 2016, all predicted margins were within the 90 percent prediction interval,[54] effectively meaning that all actual margins were within an expected range of outcomes produced by the model.

The model's results show that Ontario's 2016 retail margins and pump prices were rational given each market's characteristics. Ontario markets exhibited competitive price behaviour, and their prices were shown to be largely influenced by the factors outlined in this report.

[52]The adjusted R^2 was 0.87 - this is a statistical measure of the proportion of the variation in the dependent variable (margin) that are explained collectively by the independent variables (factors).
[53] ANOVA analysis showed a p-value below alpha (0.05), and F-test statistic above the critical value, both signifying statistical significance of the model results.
[54]This can be interpreted as a 90 percent probability of future observations with these characteristics being within this interval.

Table 2: Kent Retail Margin Model Results - Ontario 2016

Market	Average Throughput (Litres)	Big-Box Presence	Price Volatility (%)	Average Distance to Primary Terminal (km)	Modelled Retail Margin 2016 (cpl)	Actual Retail Margin 2016 (cpl)	Difference - Actual vs Modelled (cpl)	90% Prediction Interval + or – (cpl)
Barrie	8,470,057	Yes	25.4	71	7.05	6.93	-0.12	2.01
Brantford	5,153,685	No	27.4	37	9.07	8.35	-0.72	1.85
Guelph	6,743,696	Yes	27.7	44	7.26	7.96	0.70	1.84
Hamilton	6,544,442	Yes	27.8	8	7.20	7.57	0.37	1.87
Kingston	5,640,756	No	58.9	5	3.62	5.05	1.43	2.00
Kitchener	7,095,755	Yes	22.8	55	7.94	7.52	-0.42	1.86
London	5,925,936	Yes	30.1	8	7.05	5.41	-1.64	1.89
North Bay	5,137,277	No	18.5	124	10.76	9.66	-1.10	1.95
Oshawa	7,341,623	Yes	24.0	51	7.65	8.86	1.21	1.87
Ottawa	6,228,280	Yes	26.3	11	7.57	7.97	0.40	1.88
Peterborough	6,743,879	Yes	50.2	76	3.62	2.42	-1.20	1.94
Sault Ste Marie	4,899,206	No	36.7	7	7.56	7.67	0.11	1.88
St. Catharines	7,186,305	No	63.0	47	2.50	1.71	-0.79	2.13
Sudbury	4,959,790	No	34.6	8	7.89	7.48	-0.41	1.88
Thunder Bay	3,899,593	No	18.6	7	10.91	11.29	0.38	2.02
Timmins	4,755,231	No	20.6	219	10.80	11.59	0.79	2.25
Toronto	7,424,996	Yes	21.9	19	9.11	9.43	0.32	2.11
Windsor	6,002,247	Yes	55.9	86	2.98	3.67	0.69	2.06

Section 8: Overview and Analysis of Price Regulation

Summary of Findings:

1. The Competition Bureau is a federal law enforcement agency operating under the purview of the Competition Act, ensuring competition in Canadian markets to protect both businesses and consumers.

2. The Bureau stated that the frequency of complaints is down from a decade ago. They receive approximately 1,000 complaints per year, which is down from roughly 2,500 to 3,000 complaints per year in the early 2000's. The Bureau's scrutiny of competition in retail fuel markets is not limited to complaints however, they regularly and actively monitor market behaviour.

3. The power to regulate retail gasoline prices rests with provincial governments, and those in Quebec and Atlantic Canada have enacted fuel price regulations using structures such as price floors, price ceilings, or a combination of the two.

4. In Newfoundland, there is evidence that retailers used the weekly setting of the regulated maximum as a price signal, often deviating from a lower market-derived price, to a higher statutory price in coordination with their regulation's administrative cycle. It is likely that if regulated maximum prices did not exist in Newfoundland, pump prices would not have behaved in this manner. This has likely contributed to retail margins that are among the highest in the country.

5. In Nova Scotia and Prince Edward Island, the average retail gasoline price had not moved above the regulated minimum price at any point over a 10-month span, indicating that the regulated price ranges (ceiling and floor) may not have been a reasonable reflection of where the market-driven price would have been.

6. Pump prices in seven of New Brunswick's largest markets had not reached the regulated maximum price at any point over a 10-month span. This demonstrates that retailers were competing at prices within but irrespective of the regulations, suggesting that New Brunswick's gasoline price regulations were in effect, meaningless over this period.

7. As with any regulation, the stated objectives of price regulation are not always consistent with its outcomes, and they can fundamentally alter the competitive dynamics of a market. There is evidence that current price regulations in some provinces are affecting markets in ways that may not necessarily benefit consumers.

Price Competition and Regulation

All retail competitiveness in Canada – regardless of the type of industry – comes under the purview of the Competition Act, which is administered by the federal Competition Bureau. The Bureau enforces provisions of the Act which prohibit:

- Abuse of dominant position: where a firm (or several firms in collaboration) uses its market power to lessen competition.
- Price discrimination: where a supplier charges different prices to competitors in the same market who purchase similar volumes of products.
- Conspiracy: where several competitors act to fix prices for the purpose of reducing competition;
- Price maintenance: where a supplier exerts upward influence on prices upon a retailer.

While this report does not intend to undertake a detailed review of the effect of the Act, our discussions with the Bureau provided some insight into the work that they do to address competition and price-related issues in the petroleum sector.

The Bureau receives complaints about petroleum related matters from a number of sources and through a variety of means:

- Most complaints pertaining to gasoline prices come directly from consumers;
- There has been a rise in the number of Town Councils or MPPs submitting complaints on behalf of constituents, or large letter writing campaigns at the municipal level;
- Complaints from fuel retailers are less frequent, and are more heavily weighted in areas with a higher representation of independent marketers; and
- The Bureau also encourage the reporting of wrongdoing through “Immunity and Leniency” programs and Whistleblower initiatives.

In our discussions with the Bureau, they stated that they currently receive about 1,000 complaints per year, which is down from 2,500 to 3,000 complaints in the early 2000’s. The Bureau stated that part of the reason for a lower rate of complaints may be due to their improved communication on competition-related matters, and by providing complainants with more informational resources.

According to the Bureau, only about 25% of the complaints they receive require further action be taken. They estimated that 75 percent of complaints required no action, and while there were “several” investigations in the last year, there were no related charges laid. In the past decade, only a small number of cases resulted in convictions, mostly involving local retailers or isolated incidents.

The most common complaint received by the Bureau (roughly 70 percent) is that “prices are too high,” and while the Bureau will review these complaints, the vast majority require little or no action to be taken, mostly because they either lack sufficient evidence or have

lower investigative value. Other complaints are generally split between uniform pricing issues, pump prices that are out of sync with input pricing (retail prices not following crude prices, for example), and predatory pricing[55] (which often comes from retailers or marketers).

The Bureau typically responds to the complainant via an email or letter, explaining the Bureau's role, competition and markets, and the action (if any) to be taken. They may also provide links to other informational resources.

The Bureau's scrutiny of competition in retail fuel markets is not limited to complaints: they regularly and actively monitor market behaviours, including those in price-regulated markets.

Very broadly, competitiveness factors can be defined as those forces which act upon the industry to facilitate or inhibit competitive practices. It is clear that government policy can play a role in facilitating, or inhibiting, a competitive climate.

The Aims and Mechanics of Price Regulation

The federal government does not have the jurisdiction to enact legislation on the retail price of gasoline except in a national emergency; the power to regulate retail gasoline price rests with provincial governments.

The decision and approach to regulate fuel prices generally depends on the objectives of the provincial governments: whether they seek to protect consumers from the perception of unfairly high pump prices, whether they seek to protect consumers from price volatility, or whether they seek to protect smaller retailers from dominant industry participants. Related to these objectives, governments in Quebec and each of the Atlantic Canada provinces have enacted fuel price regulations using regulatory structures such as price floors, price ceilings, or a combination of the two.

Price Floor Regulation

A price floor regulation effectively establishes a base price that below which, retailers are prohibited from selling. The rationale for a price floor assumes that smaller players need protection from dominant players, and seeks to prevent those smaller players from being forced out of the market due to insufficient or negative margins.

This type of regulation has the perceived benefit of providing protection for independent marketers and promoting a diversity of market participants, which in the long-term is viewed as contributing to competitive pump prices.

[55] This is where a dominant company charges low prices to drive a competitor out of business, and then raises their price to recover any losses.

There are, however, some perceived drawbacks to this regulatory approach, such as inhibiting the entry of price-competitive marketers, whose general pricing practices may put them in contravention of the regulations.

In addition, this type of regulation can inhibit the exit of inefficient competitors, a natural consequence of a competitive market. As a result, there may be an over-representation of retail outlets, resulting in lower throughputs, higher margin requirements, and consequent higher prices.

Price Ceiling Regulation

Price ceilings, set a maximum price that stations cannot exceed, the rationale for which assumes there is insufficient competition, leading to unreasonably high pump prices. The perceived benefits of this type of regulation include protection of consumers from high pump prices, and also protection from price volatility. Consumers can also benefit in an increasing price environment due to administrative lag (for example, if maximum prices are only adjusted on a two-week cycle).

A potential drawback of this type of regulation is that, to the extent the ceiling is restrictive, it could discourage investment in that market, or unfairly "squeeze" smaller retailers that require higher margins. A price ceiling can also act as a price "signal" to marketers, potentially causing a deviation from a market-derived price towards the statutory price, which can be a detriment to consumers. This is discussed later in this section.

Price Regulation in Canada

Quebec

Enacted in 1997, the Province of Quebec enforces its price floor regulation through the Régie de l'énergie. That regulation prohibits selling gasoline or diesel fuel at a retail price which is less than the "cost to the retailer," which is established on a weekly basis and includes the wholesale rack price, transportation costs, and taxes.

Newfoundland and Labrador

Since 2001, the Board of Commissioners of Public Utilities (PUB) has been responsible for establishing and monitoring prices for petroleum products under the Petroleum Products Act in Newfoundland and Labrador.

The Board sets a weekly maximum price for regular, mid-grade, and premium gasoline as well as diesel. The maximum prices for each zone are determined using New York Mercantile Exchange (NYMEX) commodity prices as benchmarks, and then adds an allowable margin, as well as a zone differential, and taxes.

Intervention adjustments to the maximum pricing may be made in extraordinary circumstances, such as in response to significant volatility in commodities markets. These types of interventions are extremely rare.

Nova Scotia

Since 2006, the Nova Scotia Utility and Review Board (NSUARB) sets gasoline and diesel fuel prices under the Petroleum Products Pricing Act and its associated regulations. They set zonal maximum and minimum prices for all grades of gasoline and ultra-low sulphur diesel on a weekly basis.

Nova Scotia's regulations use New York Harbor spot prices to determine a benchmark for each grade of fuel, and adds an allowable wholesale margin, along with transportation allowances (dependent on zone), a forward averaging correction, a winter blending allowance for diesel, federal and provincial taxes, and finally a minimum and maximum allowable retail margin.

Nova Scotia's regulatory objective is to assure just and reasonable prices while maintaining security of supply, and as such, NSUARB is permitted to "interrupt" the scheduled weekly setting of prices if necessary.

New Brunswick

Since 2006, the New Brunswick Energy and Utilities Board (EUB) has set motor fuel pricing in New Brunswick under the Petroleum Products Pricing Act (PPPA). The stated objectives are that consumers should benefit from the lowest price possible without jeopardizing continuity of supply. The EUB sets maximum prices for motor fuels weekly.

The maximum prices are determined using the identified weekly average NYMEX price as a base to which allowable wholesale and retail margins are added. In addition, the formula adds delivery costs and all applicable taxes. The PPPA does not make use of zonal pricing, so there is only one maximum price set for each regulated product in the province.

Although maximum prices are set weekly, periodic adjustments to the maximum price can be triggered if there are significant changes in the daily benchmark prices.

Prince Edward Island

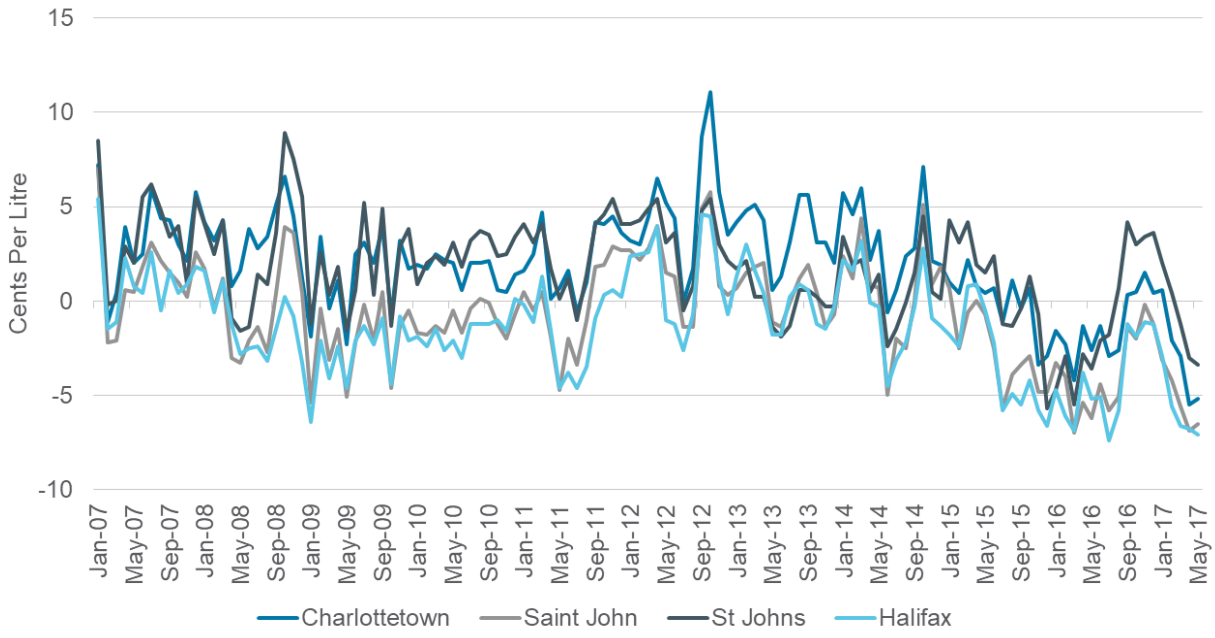
Since the late 1990's, the Island Regulatory and Appeals Commission of Prince Edward Island has been responsible for regulating gasoline and diesel prices under the authority of the Petroleum Products Act. The Commission's role is to ensure a "just and reasonable" price for heating fuel and motor fuel to consumers and licensees within the province. In order to fulfill this role, a minimum and maximum price range is set for retail gasoline and diesel on the first and fifteenth of each month.

The Commission's pricing decisions are less formulaic than other provinces' regulations, and allow for more discretion on the part of regulators. Generally, the Commission monitors petroleum markets, and any price adjustments are considered against price fluctuations for refined products in these markets. The Commission may also take into account the volumetric impact of any proposed change, as well as regional market conditions.

An Analysis of Price Regulation Effectiveness in Canada

Fuel price regulations often aim to replicate an unregulated market, while seeking to limit or control one or more variables. As with any regulation however, the stated objectives are not always consistent with the outcomes: depending on how regulations are structured, there can be unintended consequences, which can alter the competitive dynamics of a market. In the context of this report, there is evidence that a number provinces' price regulations are affecting markets in ways that may not necessarily benefit consumers.

Figure 45: Retail Ex-Tax Gasoline Price Difference to Toronto



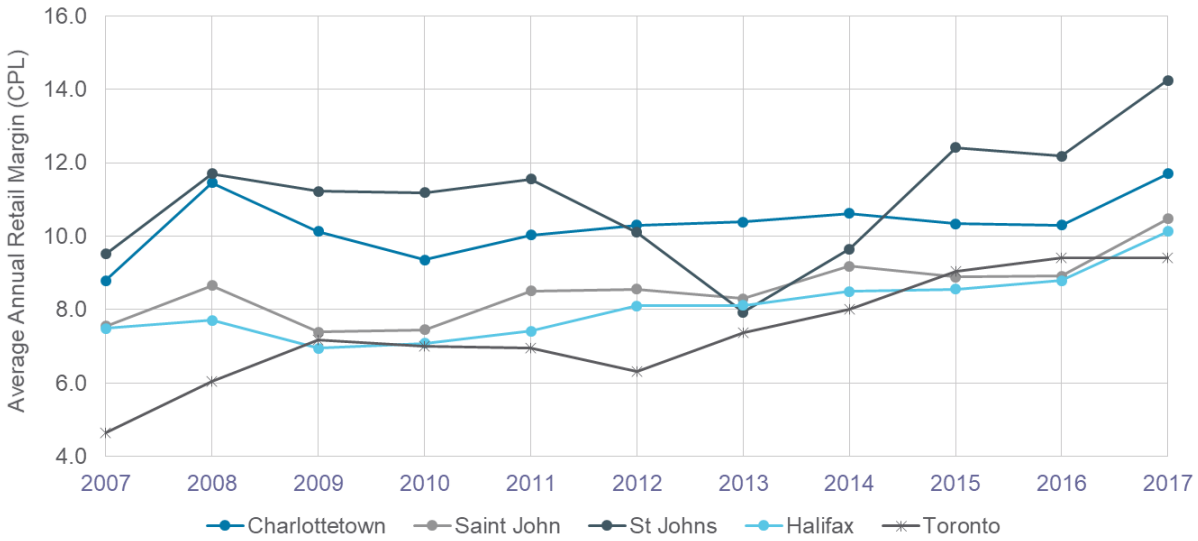
Source: Kent, 2007 - 2017

Figure 45 shows the average ex-tax price differential between regulated markets in Atlantic Canada and Toronto. For most of the period between 2007 and 2014, ex-tax prices in Atlantic markets were higher than Toronto; however, this shifted over the last couple of years, with Atlantic prices mostly dipping below Toronto's. Some may interpret

this as the regulations effectively keeping prices low, but in reality, it is due to Atlantic Canada's relatively low wholesale gasoline prices over the last couple of years.[56]

A better indicator of the relative consumer benefit of regulations is the relative movement of regulated vs. unregulated retail margins over time. Figure 46 shows that over the last decade, average retail margins in the urban centres of regulated Atlantic Provinces were higher than Toronto's retail margins, and since 2014, their margins have risen more than in Toronto.

Figure 46: Average Annual Retail Margins



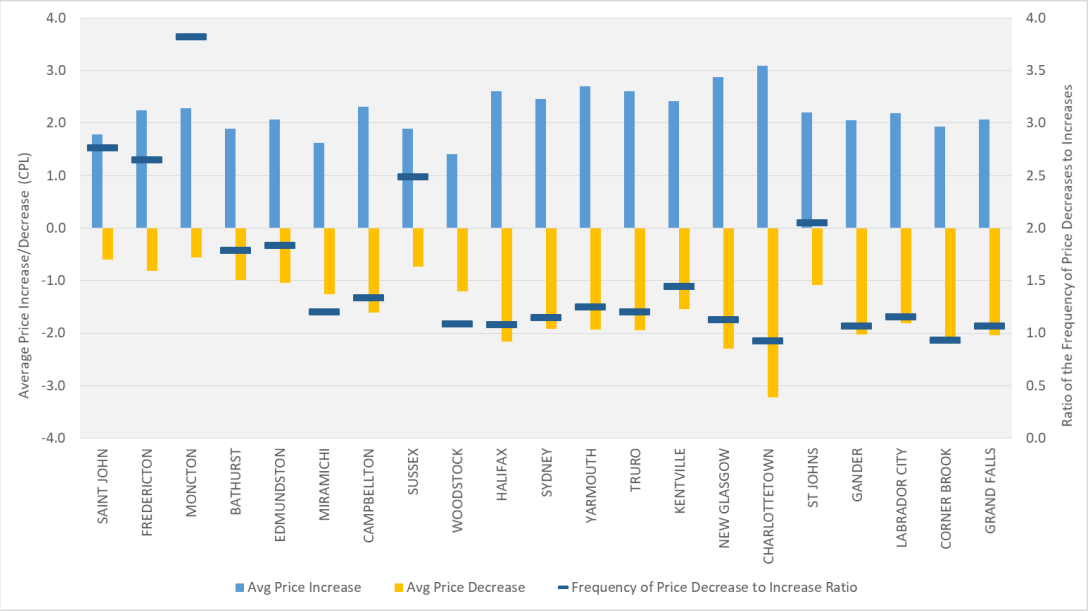
Source: Kent, 2006 - 2017

Still, an observation of higher retail margins in regulated provinces is not enough to characterize their price regulations as somehow ineffectual. It is necessary to review each of the regulated jurisdictions, and to observe how price regulations may be altering pricing behaviour, and ultimately the competitive dynamics of those markets.

[56]Atlantic gasoline rack prices have averaged roughly 3.5 cents per litre below Ontario rack prices since the beginning of 2015 and this has largely been driven by import price competition.

In Section 7 of this report, we defined a common competitive price pattern ('rockets and feathers'), and described how in unregulated markets that activity is expressed in lower prices and retail margins. In those markets, prices typically declined more often than they rose (a ratio of 2.2 to 1), and the comparative size of the average price increase to price decrease was 2.6 cents per litre to 1 cent per litre. This is characteristic of competitive price behaviour.

Figure 47: The Magnitude and Frequency of Price Increases and Decreases



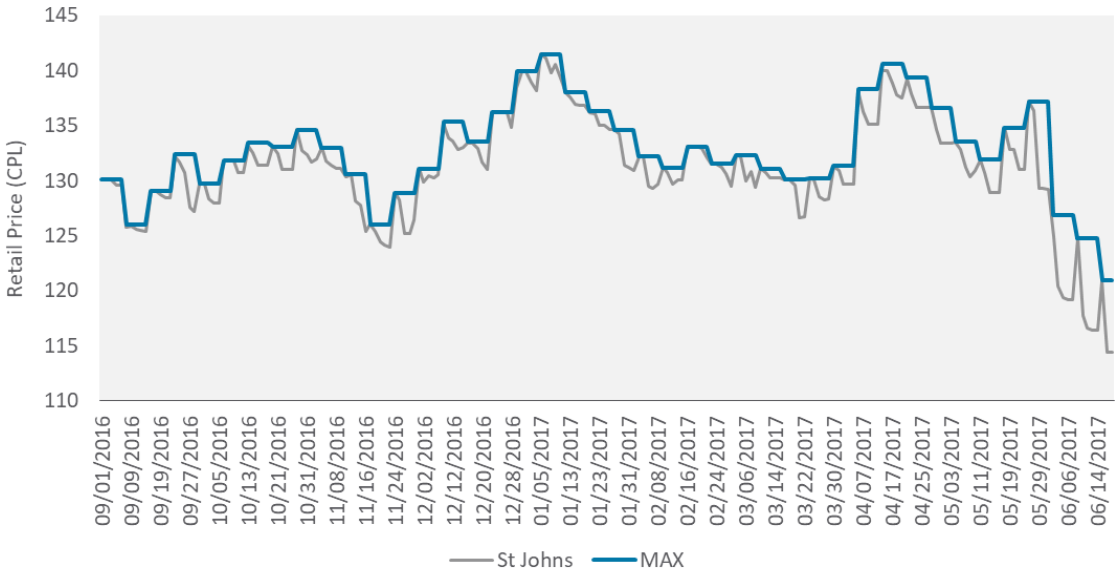
Source: Kent, based on daily price data in 21 regulated markets, 2016-2017

Figure 47 shows a very different type of price behaviour in regulated markets, particularly those in Newfoundland, Nova Scotia, and Prince Edward Island. In those provinces, the ratio of price decreases to price increases, both in terms of frequency and size, was essentially 1 to 1. These regulated provinces exhibited much less price volatility, which has previously been shown to be associated with relatively higher pump prices.

Over a ten-month period, retail prices in St. John's, Newfoundland had followed a distinctive pattern of movement that appears to follow the administrative cycle of their regulations. On the date that regulated prices are set to change, prices rose to meet the regulated maximum, then tapered off throughout the week, only to rise back up to the maximum on the date of the next regulated price change.

This could be an indication that retailers used the regulated maximum as a price signal, deviating from a lower market-derived price, to a higher statutory price. It is likely that if regulated maximum prices had not existed in Newfoundland, pump prices would not have moved in this manner.

Figure 48: St. John's Retail Gasoline Prices Compared to the Regulated Maximum



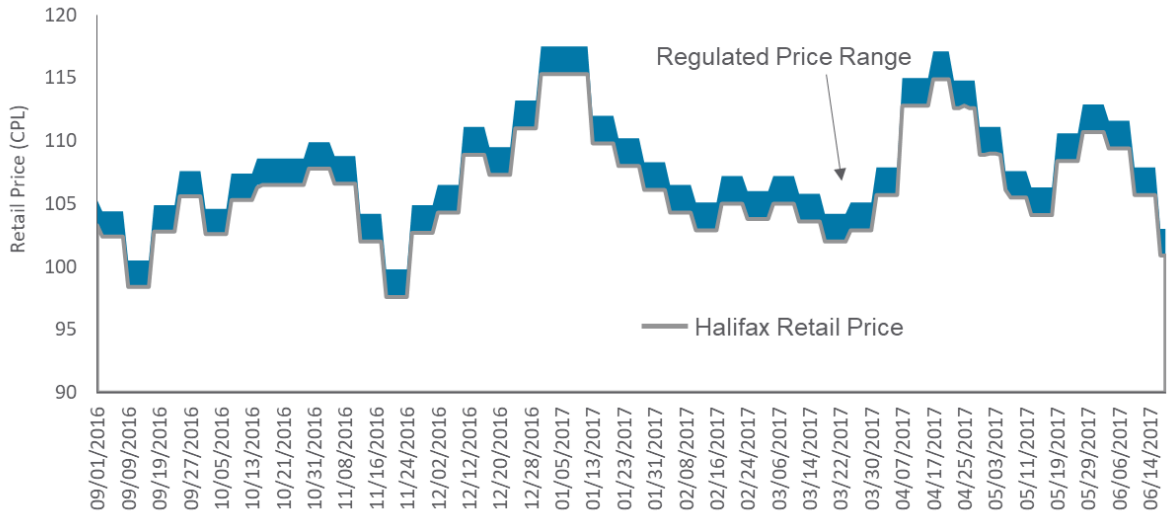
Source: Kent, 2016 -2017

Although not shown in Figure 48, retail prices in smaller Newfoundland municipalities kept their pump prices at (or near) the regulated maximum throughout the week, only moving when the regulated maximum price was re-set. This has likely contributed to retail margins that are among the highest in the country.

Nova Scotia's regulations utilize a combination of a price floor and ceiling; the regulated range between the minimum and maximum retail price in all zones is currently 2.1 cents per litre. In Halifax, the average retail gasoline price had not moved above the regulated minimum at any point over the ten-month period (Figure 49), and similar trends were observed in other Nova Scotia[57] markets. This, combined with retail margins growing faster than non-regulated markets, indicates the regulated range may not have reflected where prices would have been in an unregulated market. It is likely that if price regulations in Nova Scotia had not existed, retail gasoline prices would have been lower, driven below the current regulated minimum by competitive market forces.

[57]Kentville, Yarmouth, New Glasgow, Truro and Sydney.

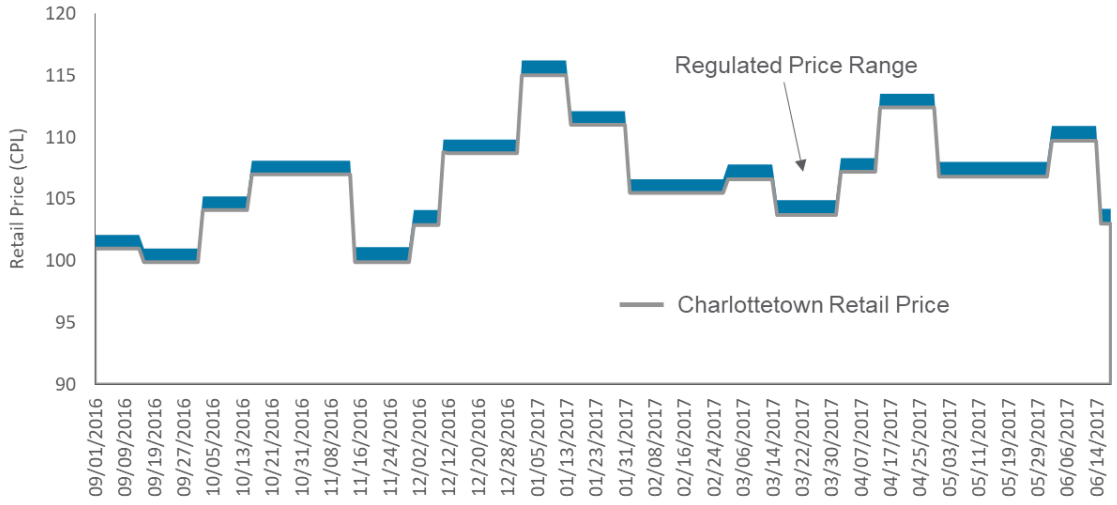
Figure 49: Halifax Retail Gasoline Prices Compared to the Regulated Price Range



Source: Kent, differential between the regulated maximum and minimum price for 2016 – 2017

Prince Edward Island uses a regulatory mechanism that is similar to Nova Scotia, employing both a floor and ceiling with an established regulated price range of just 1.1 cents per litre. Like markets in Nova Scotia, retail prices in Charlottetown had not moved above the regulated minimum over the ten-month period (Figure 50). This is evidence that price regulations altered the pricing behaviour of retailers, potentially making these markets less competitive, and likely leading to higher prices for consumers.

Figure 50: Charlottetown Retail Gasoline Prices Compared to the Regulated Price Range



Source: Kent, differential between the regulated maximum and minimum price for 2016 – 2017

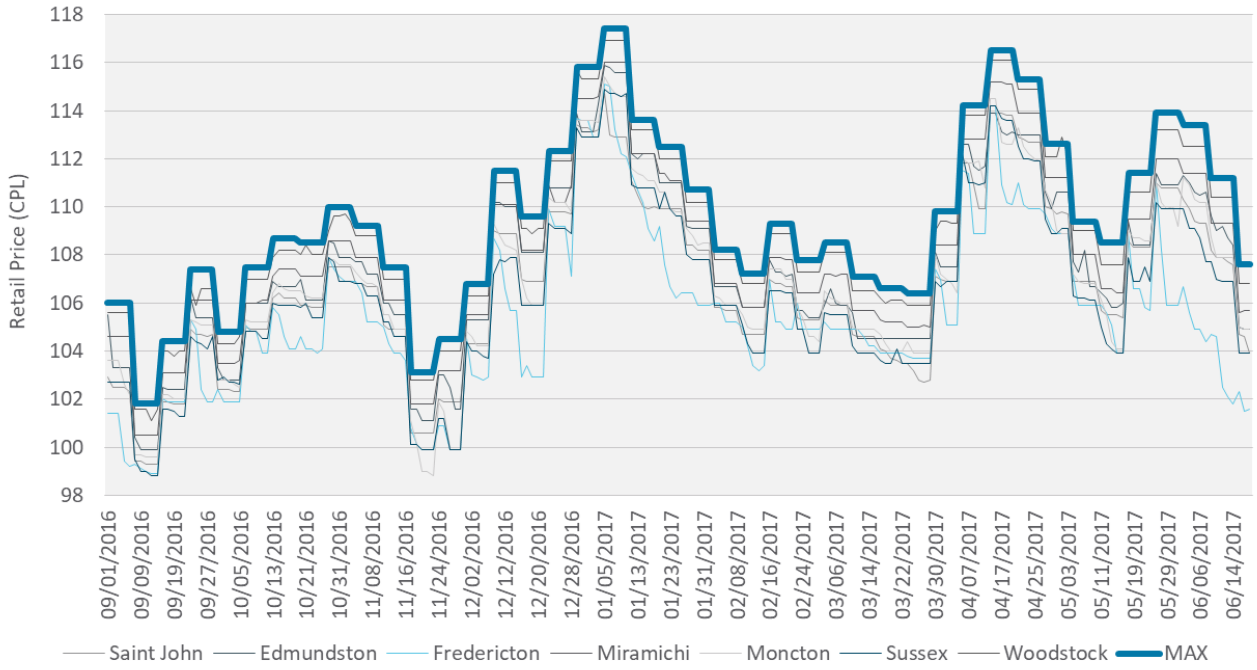
One aspect of pricing that a combined ceiling and floor effectively dampens is volatility, but as this report established, price volatility is an indicator of competitive price activity

and generally leads to lower average pump prices. It appears that regulations in Nova Scotia and Prince Edward Island affected pump prices in ways that are beneficial only if price stability is valued by consumers more than overall cost.

New Brunswick, like Newfoundland, uses a price ceiling structure which establishes a maximum price that retailers cannot price above. Average pump prices in seven of New Brunswick's largest markets (Figure 51) had not reached the regulated maximum price at any point in the ten-month period. This means that retailers competed at prices that were never constrained by the regulated price. There is a compelling case in New Brunswick that price regulations on retail gasoline were having no impact at all, and are, in effect, meaningless.

New Brunswick's regulations did not appear to be materially affecting market behaviour or pump prices, and this is supported by the price volatility and price movement data presented in Figure 51. New Brunswick's price activity was very similar to the "rockets and feathers" phenomenon observed in unregulated markets; prices decreased more frequently but increased with more magnitude (on a scale closer to 2 to 1), where more tightly regulated markets were characterized by price decreases and increases at a 1 to 1 ratio. It is likely that if regulations in New Brunswick did not exist, pump prices would not have been affected.

Figure 51: New Brunswick Retail Gasoline Prices Compared to the Regulated Maximum Price



Source: Kent, 2016 – 2017

APPENDIX A: Glossary of Terms

Ancillary service: a service provided in addition to the basic retail petroleum sales operation, such as convenience stores, car washes, quick-serve restaurants.

Dealer: a generic term referring to a retail outlet operator or "retailer." There are several modes of dealer operation, such as lessees, independent dealers, and commission dealers.

Distribution Costs: the cost, generally expressed in cents per litre, of transporting petroleum product from the rack point to the final point of sale, such as a retail gasoline outlet.

Downstream: the segment of the oil industry involved in the refining and/or marketing of petroleum products such as gasoline, diesel, etc.

Ex-tax Pump Price: the retail price of gasoline that would be displayed if all product taxes were removed. These product taxes include Excise tax, GST, provincial pump tax, and in some regions, municipal taxes. The ex-tax pump price is *exclusive* of these taxes, but *inclusive* of any corporate taxes on earnings.

Excise Tax: a federal tax on retail gasoline purchased by domestic (motor vehicle) consumers, currently established at 10¢ per litre, and included in the retail pump price.

Independent Petroleum Marketer: a petroleum marketer who is not involved in the refining of petroleum products, and therefore purchases its supply of petroleum product from an outside source, such as a major oil company or regional refiner/marketer.

Integrated Oil Company: a petroleum marketer which is involved in both the upstream and downstream aspects of the oil industry.

Lessee: a particular mode of retail petroleum operation where the outlet operator (dealer) leases the retail outlet from the product supplier, and purchases petroleum products from the same supplier for resale at a pump price determined by the lessee.

Major Oil Company: a petroleum organization involved in both the refining and marketing of petroleum products which has marketing operations in most or all of Canada's provinces.

Margin: the difference which exists between net sales and the cost of merchandise sold and from which expenses are usually met or profit derived. Usually expressed on a per-unit basis, for example, in cents per litre.

Marketer: an organization who sells refined petroleum products to end-use consumers.

Mode: the type of contractual relationship between the supplier and the dealer (outlet operator). In the retail gasoline sector, these can be broadly classified as company operated, commission dealer, lessee, and independent dealer.

Rack Price: the wholesale price posted at the rack point.

Rack Point: the point at which title to refined product is transferred from the refiner to the supplier. This may be at a refinery loading terminal, or at one on several loading terminals (usually in major population centres) where petroleum is marketed to non-refiner supplier/marketers at posted rack prices.

Refiner: an organization who, manufactures (from crude oil) a range of petroleum products suitable for consumer use.

Refinery Utilization Rate: a representation of the percentage of operable capacity being used at a refinery. The rate is calculated by dividing gross refinery inputs (crude) by the operable refining capacity.

Regional Refiner/Marketer: a petroleum organization involved in both the refining and marketing of petroleum products which has marketing operations in a limited number of provinces.

Supplier: within the context of retail gasoline marketing, the supplier has initial title to the petroleum product as it leaves the rack point, is typically also the brand name owner of the chain of gasoline stations to which it supplies refined petroleum products.

Throughput: the volume (in litres) of petroleum sold at a retail outlet in a given period, usually per year.

Transfer Price: the internal price paid by an integrated refiner/marketer to its own refinery for refined petroleum products. Although in theory the transfer price could be set at any arbitrary value, it is usually based on the market-driven rack price.

Upstream: the segment of the oil industry involved in the exploration and/or production of crude oil, the raw material from which petroleum products are manufactured.