



The Conference Board of Canada

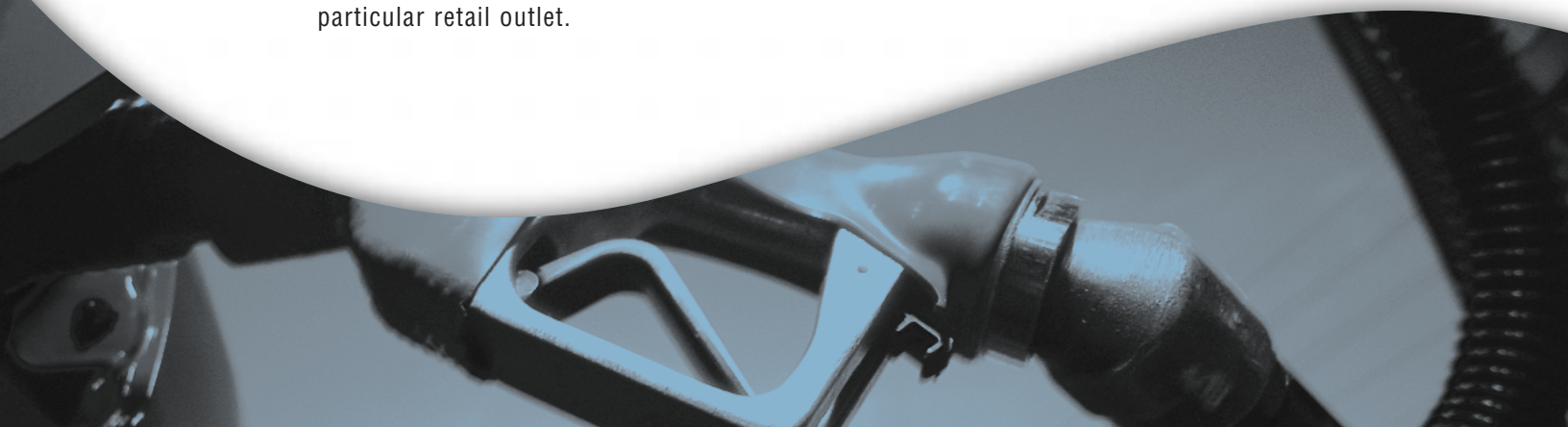
THE FINAL FIFTEEN FEET OF HOSE

The Canadian Gasoline Industry in the Year 2000

January 2001

HIGHLIGHTS

- Canadians are well served by the current market system that determines gasoline prices. We enjoy some of the lowest gasoline prices in the world.
- The rapid increase in world crude oil prices is the main culprit in rising Canadian gasoline prices. Retailers can influence often only approximately 4.5 cents of the pump price of gasoline.
- The volatility and uniformity in gasoline prices is a direct result of the competitive nature of the business at the street level and the unique way that gasoline prices are posted on large signs outside each retail outlet across the country, as well as the volatility of crude oil prices.
- Big box operators are a potential source of new competition in the Canadian gasoline marketplace, especially as gasoline becomes one of many products sold at a particular retail outlet.





The Conference Board of Canada

About The Conference Board of Canada

The Conference Board of Canada is an independent, not-for-profit research organization with affiliates in the United States and Europe. Our mission is to help our members anticipate and respond to the increasingly changing global economy. We do this through the development and exchange of knowledge about organizational strategies and practices, emerging economic and social trends and key public policy issues. Since 1954, the Board has been committed to researching innovative practices, designing new strategies and providing our members with the most up-to-date information, analysis and expertise to help them excel in Canada and around the world.

About the Economic Services Group

The Economic Services Group is a research division at The Conference Board of Canada. The Group's purpose is to address the specific information requirements of the Conference Board's members by conducting financed research. Services include customized economic forecasting at the municipal, provincial and national levels; economic impact analysis; custom-tailored econometric models; consumer and business attitudes surveys; and analysis of the economic implications of changes in public policy.

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The Final Fifteen Feet of Hose: The Canadian Gasoline Industry in the Year 2000

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Ad-valorem tax—an indirect tax that is expressed as a percentage of the price of a commodity, e.g., Goods and Services Tax (GST), Provincial Sales Tax (PST) and Harmonized Sales Tax (HST).

Agency—a mode of operation for a gasoline retail outlet where the outlet operator acts as an agent for the company that supplies the branded product. The supplier determines prices.

Ancillary services—services provided by a retail gasoline outlet in addition to the sale of petroleum products, such as convenience stores, car washes and fast-food outlets.

AQUIP—Association Québécoise des Indépendants du Pétrole, the representative association of the independent retailers in the province of Quebec.

Bulk plant—a storage facility used in the wholesale segment of the industry, comprised of a gathering of small- to medium-capacity tanks.

C.p.l.—cents per litre.

Coking—a refining process for thermally converting and upgrading heavy residual into lighter products and by-product petroleum coke.

CPPI—Canadian Petroleum Products Institute, an association of petroleum refiners and marketers in Canada.

Crack spreads—price per litre of wholesale gasoline over the price per litre of crude oil.

Cracking—a refining process under which heavy molecular weight hydrocarbons are broken up into lighter hydrocarbon molecules by the application of heat and pressure, with or without the use of catalysts.

Crude oil—the raw material from which petroleum products are manufactured.

Dealer—a generic term referring to a retail outlet operator. There are several different modes of operation used, including company owned, commission retailer, lessee operator, independent branded and independent non-branded.

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

Excise tax—a federal or provincial tax on retail gasoline purchased by consumers, established at a certain level of cents per litre. An excise tax is a flat tax.

Ex-tax pump price—the retail price of gasoline, excluding all taxes.

Grade differential—the difference between the price of regular unleaded gasoline and premium or mid-grade gasoline.

Independent marketer—a retail petroleum operator who is not involved in the refining of petroleum products, and therefore must purchase its supply of petroleum product.

Integrated oil company—a fully integrated oil company is involved in the upstream (i.e., exploration and production) and downstream (i.e., refining, marketing, distribution and retailing) segments of the industry. A partially integrated oil company is involved in all aspects of the downstream segment only.

IRGMA—Independent Retail Gasoline Marketers Association of Canada, an association of independent retailers in Canada.

Lessee—the operator leases the retail outlet from the product supplier.

Majors—multinational and national integrated oil companies (Imperial Oil, Shell and Petro-Canada).

Market share—volume of gasoline sold by one company divided by the total volume of gasoline sold in a particular market.

Marketer—see Retailer.

Marketer's margin—see Retail Margin.

OPEC—the Organization of Petroleum Exporting Countries.

Outlet—generic term referring to a retail gasoline station.

Pump price—unless qualified, the self-serve pump price for regular unleaded gasoline (RUL).

Rack—refers to the wholesaling of gasoline products. Unqualified, the term refers to the wholesaling of gasoline products from a bulk plant or terminal location. Qualified as “at the gate rack,” the term refers to wholesale purchase of gasoline products at the refinery.

Rack point—the point where refined product can be purchased at the rack price to non-refiner suppliers/marketers.

Rack price—the posted wholesale price of gasoline.

Refiner—an organization that produces a range of petroleum products from crude oil suitable for consumer use.

Refiner's margin—the difference between the wholesale price of gasoline and the price of crude oil, the amount that a refiner receives to cover its operating costs.

Regionals—regional integrated oil companies (Ultramar, Sunoco, Irving, Husky, Chevron, Parkland, Federated Co-op and Arco).

Retail margin (gross)—the difference between the cost to acquire product at wholesale and the selling price of the product at retail, exclusive of taxes. Usually expressed on a per-unit basis, for example, in cents per litre.

Retailer—an organization that sells gasoline to end-users.

Supplier—an organization that supplies end product to retailers.

Tankwagon—tractor trailer used for short-haul delivery from a bulk plant or terminal to a retail outlet.

Terminal—storage facility used in the wholesale segment of the industry, usually comprised of a gathering of large-capacity tanks.

Throughput—the volume of petroleum sold at a retail outlet in a given period, usually expressed in litres per month or per year.

Upstream—the segment of the oil industry involved in the exploration and/or production of crude oil.

Approach to the Research

This study of the gasoline industry in Canada represents the culmination of more than six months of intensive research undertaken by The Conference Board of Canada. During the initial phase, which started in April 2000, the Board held discussions with many stakeholders in the industry from every region of the country. The meetings included the major and regional refiner-marketers and both large and small independent operators. Associations that represent consumers, independents and refiner-marketers were also contacted, as were individual station owners, employees and interested Canadian consumers.

As a result of these pre-research consultations, a number of specific research issues were identified. During the empirical research phase, these questions were answered and a Draft Research Report was prepared. The report included a detailed empirical examination of issues ranging from the factors that influence wholesale and retail prices at the city level to the question of price increases before long weekends.

Post-research dialogue sessions were held with stakeholders in five cities across Canada in order to validate the findings of the Draft Research Report and to identify areas in need of clarification. Following these sessions, a final report was completed. It updates and modifies the draft in light of the comments received. Several new sections that address issues raised by the session participants were also added.

While the Conference Board is aware that earlier studies of the gasoline industry in Canada have already been carried out, we are confident that our study will shed new light on, and provide some additional insights into, the workings of the industry. Past studies of the industry have focused on specific issues without explicitly addressing the views of key players in the industry. Our extensive consultations enabled us to provide a balanced perspective on the many contentious issues that affect the industry. Throughout the report, the reader will find sections devoted to the concerns of the different stakeholders in the industry and the Board's views on these issues. Also, the consultations provided us with an important insight into the day-to-day operations of the industry. These insights permitted us to explain in simple terms to Canadians issues such as price volatility, price wars and the uniform movement of retail prices at the street level.

Our empirical analysis makes use of a new approach that we believe provides a greater understanding of how retail prices react to changes in wholesale prices. As a result of competition, a retail market outcome margin exists in each city based on local conditions. This margin becomes the basis for price changes in that market and reflects a margin at which most competitors are able to sustain themselves. The response in the retail price following a change in the crude and wholesale price differs depending on whether the actual margin in place is higher or lower than the market outcome margin.

The purpose of this report is to present an up-to-date profile of the Canadian gasoline industry and try to address some of the preoccupations of industry stakeholders and the perceptions of Canadian motorists.

The gasoline industry in Canada follows economic rules of supply and demand, over which it has little control. The price of gasoline's major input, crude oil, is determined outside Canada's borders on world markets highly influenced by OPEC decisions on increased or decreased supply. In addition, even the wholesale price of gasoline in Canada is as much determined by U.S. conditions as it is by cost, supply or demand within our borders. We live in a continental market for gasoline.

Pump prices vary tremendously from one city to the next. On November 14, 2000, a litre of regular unleaded gasoline was 90.9 c.p.l. in Cornerbrook, Newfoundland, and 65.8 c.p.l. in Edmonton, Alberta. However, when taxes are removed from the retail price, we see a commodity that has similar prices across Canada, differentiated predominantly by local competitive conditions, average sales volumes and freight costs.

The gasoline industry in Canada has a limited number of key players who, through their vertical integration and sheer size, are often expected to have power in the marketplace. At the same time, on occasion, we see the vulnerability of these Goliaths to independent Davids and new market entrants whose aggressive

pricing policies precipitate price wars that have implications across the entire industry and throughout the country.

This report tries to present a balanced portrait of the Canadian gasoline industry. Below are some of our major observations about the questions that preoccupy Canadians from both within and outside the industry.

- **Crude oil and taxes make up about 84 per cent of the average price of a litre of regular unleaded gasoline.** This leaves approximately 16 per cent to cover the costs of refining and marketing, as well as the retailer's operational and fixed costs. This implies that on average in mid-November 2000, the downstream gasoline industry (refining, marketing and retailing) has influence over just 11.9 cents on a 75.9-cent litre of gasoline. Retailers influence only about 4.5 cents of the pump price of gasoline.
- **The rapid increase in world crude oil prices is the main culprit in rising Canadian gasoline prices.** Over one month, a one-cent increase in the per litre price of crude oil results in approximately a one-cent increase for Canadian motorists. The timing of the increase and its initial magnitude depend on the competitive conditions in the market. The Can. \$29.63 (U.S. \$20) increase in crude oil prices since January 1999 has caused Canadian pump prices to increase by about 20 c.p.l.
- **Consumers in Canada are very well served by the current market system that determines gasoline prices.** Retail margins have been declining throughout the 1990s as a result of improved efficiencies in the gasoline industry. This has benefited consumers as they have profited from prices that are lower than they would have been in the less efficient industry that existed prior to 1990.
- **The volatility in gasoline prices is a direct result of the competitive nature of the business at the street level** and the unique way that gasoline prices are advertised to motorists—they are posted on large signs outside each retail outlet across the country. The impact of posting prices is enhanced by the sensitivity of Canadian consumers to price differentials, a lack of brand loyalty as well as the accepted perception that gasoline from one outlet is basically identical to that from any other dealer.

- **Uniformity of prices reflects the rapid response of individual dealers to the actions of their competitors.** Retail prices at competing dealers often change in step with each other. This reflects a high degree of competition at the street level and protection of market share rather than a conspiracy among companies. In the same way, the setting of wholesale prices takes into account similar factors for all refiners, mainly the cost of crude oil and the technology of production, and it is natural that prices should be similar.
- **Average sales volumes per outlet have an important impact on retail margins and prices because each outlet has fixed costs to cover.** The difference in prices between urban and rural communities, which in some instances is viewed as being way out of line, even after transportation costs have been accounted for, demonstrates the importance of sales volumes in determining retail prices. In smaller communities, the average throughput at each outlet is generally far lower than in larger communities. Lower throughputs imply that a dealer must make a higher margin in order to cover fixed costs as well as operating expenses.
- **Differences in gasoline prices between cities are generally influenced by the different competitive conditions found at the street level.** Varying local market conditions in each city in Canada can push gasoline prices in directions that reflect intense rivalry among sellers. It takes only one dealer who is determined to increase market share at the expense of competitors to upset the balance and bring about a situation where retail prices bear little resemblance to factors like transportation costs, rack prices or normal margins. Abnormalities can last from days to years, depending on local conditions.
- **There is no empirical proof that gasoline prices increase before long weekends.** While it is true that prices do sometimes shoot up before long weekends, they are just as likely to increase prior to any other weekend throughout the year. The fact is that dealers attempt to increase prices, normally in the middle of the week, in order to restore margins that have been reduced because of street level competition. If they do not succeed, prices tend to drift down on Friday and on the weekend. Increases before long weekends may more likely be accepted by competitors in anticipation of the higher holiday demand, but this cannot be proven statistically.

- **There is no proof of asymmetry in price adjustment in the retail market.** Price asymmetry refers to the phenomenon of retail prices responding more strongly to increases in crude oil prices compared with decreases. Our empirical research found that retailers appear to have adjusted their prices in the same manner for both an increase and decrease in crude oil prices in the 1990s.
- **The price of gasoline in Canada and the United States, excluding taxes, is very similar.** Canadians enjoy some of the lowest gasoline prices in the world thanks to a highly competitive retail sector and the fact that the Canadian refining industry must remain competitive with the United States, despite a larger geographic area and a smaller population base. U.S. wholesale prices, which are an important consideration in determining Canadian wholesale prices, generally lead to lower prices for the Canadian consumer.
- **Big box operators are a potential source of new competition in the Canadian gasoline marketplace.** Big box operators may not make inroads into Canada as quickly as they have in Europe or the United States. However, following developments in the industry over the past 15 years, the influence of big box operators is likely to increase. The operators are able to sell gasoline at very low margins because they can generate large gasoline throughputs, introduce cutting-edge technology, and because gasoline represents a relatively small part of their overall revenues. As pricing tends to be influenced by the most efficient operator in the market, big box stores are likely to exert continued downward influence on margins.
- **It is our judgement that cross-subsidization exists to some extent between the different activities undertaken in the gasoline industry.** However, the inter-financing of activities is neither illegal nor unusual as a business practice across the Canadian economy. Moreover, our empirical work could not find conclusive evidence of either the extent or magnitude of cross-subsidization, given the data that are available. The lack of information about the actual prices paid by most retail dealers for their supply makes it

impossible to draw any definitive conclusions on the magnitude of this issue.

We recognize that independents and major/regional refiners strongly disagree about the degree of cross-subsidization in the industry. In this study, cross-subsidization refers to the practice of using revenue from the upstream or refining sectors to support the retail sector. Majors and regionals contend that price support is limited to exceptional circumstances. On the other hand, independents claim that the practice is more common and underlies the refiners/marketers' ability to sustain low retail margins. Despite basing retail margins on rack prices that may not accurately reflect real gasoline procurement costs, our research findings are consistent with the existence of inter-financing between activities. However, the extent of the activity was either statistically insignificant or of a low magnitude.

- **Branded dealers have an advantage over the independents during a price war.** Independents must purchase product from the terminal at a posted rack price or with a minimal discount and are, therefore, not in a position to provide financial relief for their dealers. Branded dealers, on the other hand, can sometimes obtain an undisclosed discount off the rack price that may better enable them to survive the effects of a prolonged price war.

The rationalization that took place in the 1990s through reducing the number of outlets and cost cutting will continue in the present decade. All competitors will have to become more efficient in order to survive. In the 1980s, independents were able to gain market share from the major and regional refiners by creating a lower price advantage and offering ancillary services through convenience stores. In the 1990s, the major oil companies learned from the independents and expanded upon their lessons. The traditional players in the gasoline industry will have to continue to look for ways to innovate and remain competitive to survive in the 21st century, particularly as gasoline is treated more and more as just another product among many that are sold through a particular retail outlet.

Purpose

The purpose of this study is to present a realistic and unbiased portrait of the Canadian gasoline industry in the year 2000. Its goal is to give Canadians a better understanding of how domestic retail and wholesale gasoline markets work and how prices are determined at the all-important pump level—"the final fifteen feet of hose."

The study attempts to take into account many of the current perceptions about gasoline prices in Canada and view the issues from an historical perspective, while recognizing the changing structure of a relatively complex multi-stage process. The project team has listened to Canadians involved in the petroleum industry from all perspectives. We have tried to take into account their concerns and address the issues that they feel are key for the future of the gasoline industry in Canada.

The report attempts to avoid jargon and explain the issues as clearly and objectively as possible. The report may not change strongly held opinions about the gasoline industry, but will attempt to set out the facts, as we have been able to determine them. Some issues, such as taxation and competition policy in Canada, are beyond the purview of the study. Nevertheless, we have tried to present a balanced view of the gasoline industry.

The Conference Board of Canada is not a government agency. Established in 1954, The Conference Board of Canada is an independent, not-for-profit, applied research institution known for its balanced analysis and its expertise in building consensus among diverse groups.

The Conference Board of Canada is non-policy prescriptive, therefore, the study will not make

recommendations about legislation or government policy.

Background to the Study

Mandate

The Conference Board of Canada was given a mandate by Industry Canada and Natural Resources Canada to carry out a study examining the nature and functioning of the Canadian gasoline industry. The study involves a thorough investigation of the gasoline industry, and the results are to be used as the basis for a dialogue among stakeholders and other interested parties. The study began on April 1, 2000, and the final report was completed by December 31, 2000.

The study comprises two distinct components—research and dialogue sessions.

The research component was designed to address a broad spectrum of issues that were raised by stakeholders across the country and relate to the gasoline industry in Canada.

Specifically, the research component has tried to explore the nature and functioning of the retail and wholesale gasoline markets by examining the relationships between the prices of crude oil, retail and wholesale gasoline, as well as related issues such as price volatility, the speed of price adjustment and the nature and manner of price increases. The research has also looked at retail prices and supply and demand factors; the conduct, structure and performance of the gasoline industry in Canada and the differences between the Canadian and U.S. markets.

The Stakeholder Dialogue component consisted of a series of five regional symposia held in Vancouver, Calgary, Toronto, Montreal and Halifax. Their purpose was to create an

environment for diverse interests to share their concerns and to start to develop a common understanding of the issues and their origins; to develop a regional perspective on the issues; and to validate the empirical research. A separate report on these sessions is available.

Pre-research meetings with stakeholders

Over 60 meetings and teleconferences were held with stakeholders throughout the country prior to the research being carried out. The purpose of the meetings was to

inform the project team of stakeholder concerns as well as to obtain a better sense of how the gasoline industry functions. The mandate of the study was sufficiently flexible that it could be expanded to try and address these stakeholder concerns.

Stakeholder preoccupations vary among the main groups—majors and regional marketer-refiners, independent gasoline retailers and Canadian motorists. We have attempted to consistently place the topics covered in this report within the context of the concerns raised by each group.

The Gasoline Industry in Canada from a North American Perspective

CHAPTER 1

Overview

The gasoline industry in Canada is highly concentrated. Three major integrated companies—Esso, Petro-Canada and Shell—are visible at the retail level across Canada, have a presence in oil exploration and extraction in Canada and are a dominant force in refining, wholesaling and retailing. Adding in the regional refiner/marketers (Irving, Ultramar, Arco, Chevron, Parkland, Sunoco, etc.), they comprise virtually the entire refining and wholesale sectors, as well as about 80 per cent of the volume of retail sales.

Over the last decade, the industry has been characterized by considerable rationalization. The number of gasoline-producing refineries in Canada fell from 40 to 18, while the number of retail outlets declined by 40 per cent. The Canadian experience has been consistent with that of the United States, where major refiner-marketers, in particular, have been trying to increase performance and efficiencies by increasing per outlet throughput and closing less efficient stations and under-utilized refineries. This occurred partly because the majors lost an important portion of their market share to lower-priced independents during the 1980s. The more retail margins declined due to increased competitive efficiency, the more the viability of many less efficient outlets owned by both majors and independents became doubtful. Aggressive pricing policies, both by majors and independents, which led to local price wars within the industry, only made the situation worse.

Upstream

Industry Structure

The oil industry consists of two separate entities: upstream and downstream. The main activity of the upstream industry is the exploration

and development of crude oil, the raw material from which gasoline is distilled. The upstream part of the industry consists of a broad range of activities, including exploration for crude oil, drilling, production and transportation of the crude to the refinery.

Crude oil is a commodity that is traded globally and, as a result, Canadian producers must compete with the major oil-producing countries of the world to sell their product to refineries. For instance, much of Canada's crude oil, which is not consumed by national refineries, is exported to the United States via crude pipelines.

Consequently, crude from Canada must compete with U.S. domestic supply and offshore imports. Virtually all of the major and regional refiners in Canada must purchase crude oil from other producers. This means that the major integrated companies' total crude production is far less than (usually around a third of) their refinery requirements. As a result, the majors have to import much of their crude from other parts of the world or buy it from other Canadian producers at world prices.

Canada produces around 2 million barrels of crude oil per day, while total world production is about 74 million barrels per day. That means that Canadian producers have no influence over world prices because total domestic production is a small fraction of total world production (about 2.7 per cent). Canadian producers of crude oil are therefore referred to as "price takers" as opposed to "price setters." Oil prices are set in the international marketplace and reflect global conditions rather than ones that are particularly Canadian.

Crude oil is delivered to Canadian refineries by both pipeline and boat, using oil tankers. The major pipeline infrastructure is shown in Exhibit 1. Canada has 15 pipelines that move domestic

Exhibit 1
Pipeline Infrastructure in Canada

Major Oil Pipelines in Canada



Source: The National Energy Board.

crude oil across the country and to the United States. There are also two pipelines that carry imported crude into Canada from the United States. Exhibit 2 shows the different pipeline routes. There are product pipelines that carry gasoline and other refined products to markets across provincial borders, as well.

The refineries in Quebec City, Halifax and Saint John obtain their crude from oil tankers sailing from the North Sea, as well as from the Middle East, West Africa or South America. The Montreal refineries receive crude from the Montreal-Portland pipeline because the harbour in Montreal is not large enough to accommodate large oil tankers. Before 1998, Montreal also obtained crude oil from the Line 9 pipeline from Sarnia. However, in 1999 the pipeline was reversed to permit imported crude to travel to the Sarnia refineries from Montreal. In addition, Sarnia and other refineries in southern Ontario receive crude oil from pipelines originating in Chicago and from western Canadian pipelines.

In western Canada, Edmonton is the key pipeline junction. Pipelines from northern parts of Canada deliver crude to Edmonton. From there, other pipelines route crude to locations in the United States such as Montana, Washington and Michigan, as well as other domestic refineries. For instance, the Trans Mountain Pipeline carries crude oil from Edmonton to Burnaby, British Columbia. At the border, this pipeline connects with another pipeline that delivers crude to refineries in northwestern Washington. Refineries in southern British Columbia obtain crude from Edmonton or get imported crude from oil tankers.

Refineries locate sources for their crude oil taking into account transportation costs and the type of crude required by the refinery. Canada produces around two million barrels of crude a day, and its refineries use about the same amount (1.9 million barrels a day). However, while the demand and supply are almost equal, it is less expensive for refineries in eastern Canada to use imported crude because of the high cost of transporting it from

western Canada. Also, most of the crude oil from western Canada is of a heavier grade than the light crude oil from the North Sea or the Middle East. The latter is more suitable for some of the refineries located in eastern and central Canada.

Crude Oil Prices

The cost of crude oil makes up about 73 per cent of the ex-tax price Canadians pay for a litre of gasoline (November 2000). A one-cent per litre change in the price of crude oil results, within a month, in a one-cent increase in the ex-tax pump price of a litre of gasoline. Consequently, increasing crude oil prices are the most important factor in the steep rise of gasoline prices at the pump.

For example, since January 1999, the price of a barrel of crude oil has risen by around Can. \$29. A barrel of crude oil represents 159 litres. The increase in the price of crude alone accounts for 18 c.p.l. When GST is included, this amount rises close to 20 c.p.l.

Crude prices are determined internationally by fluctuations in worldwide demand and supply as well as speculation about future crude prices. As explained earlier, Canada is a price taker and has no influence on prices since it produces about 3 per cent of world supply. Crude oil markets have been shaken up since 1998 as a result of a severe recession in East Asia and excess oil production. Prices fell by approximately 30 per cent in 1998, and in January 1999 the price of a barrel of oil dropped to approximately Can. \$19 (U.S. \$13). Substantial oil production cutbacks by world producers, especially OPEC members, and strong demand in many recovering Asian countries and in North America have pushed prices back up to an average of approximately Can. \$44 (U.S. \$30) per barrel so far in 2000.

Despite the fact that the market determines the price of crude oil, OPEC remains the dominant force in terms of the direction that price takes. The 11-member cartel includes: Algeria, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, United Arab Emirates and

Exhibit 2 Canadian Crude Oil Pipelines

Company	Line	Route
Trunk Lines		
Trans Mountain Pipeline	Trans Mountain Pipeline	Edmonton to Puget Sound (Wash.)
Alberta Energy Company	Express Pipeline	Hardisty (Alta.) to Casper (Wyo.)
BP Canada	Rangeland	Edmonton to Montana
Murphy Oil	Milk River	Hardisty to U.S. border
Murphy Oil	Wascana	Regina to U.S. border
Enbridge	Main Line	Edmonton to Clearbrook (Mich.) and Sarnia
Feeder Lines		
Enbridge	Athabasca	Ft. McMurray (Alta.) to Hardisty
Alberta Energy Company	AOSPL	Ft. McMurray to Edmonton
Gibson and CNRL	Echo Pipeline	Cold Lake (Alta.) to Hardisty
Husky Oil	Hardisty	Lloydminster (Alta.) to Hardisty
Husky Oil	Lloydminster	Cold Lake to Lloydminster
AEC/Koch/CNRL	Cold Lake	Cold Lake to Edmonton
AEC/CNRL/PanCanadian/Chevron	Pelican Lake	Pelican Lake to Wabaska and Mitsue
Murphy Oil/Van Horne	Manito Pipeline	Kerrobert (Sask.) to Enbridge System
Koch Pipelines	Bow River	Hay River (Alta.) to Milk River Pipeline
Pipelines that Carry Imported Crude		
Enbridge	Line 9	Montreal to Sarnia
Portland Pipeline	Portland pipeline	Portland (Maine) to Montreal

Source: Natural Resources Canada.

Exhibit 3

From the Ground to the Pump

To understand how quickly crude oil price increases translate into higher prices at the pump, it is useful to look at how little time is involved in transforming oil into gasoline. How quickly oil is pumped out of the ground, refined into gasoline and delivered to your service station depends on different factors. For example, a refinery located in Edmonton gets its crude oil from oil fields in northern Alberta. The oil is then transported to the refinery via pipeline. If the oil field were 400 kilometres from the refinery, this would take approximately two days. If the refinery receiving the oil were in Sarnia, it would take longer to transport the oil. A refinery in Atlantic Canada receives its crude oil supply by tanker from the North Atlantic. Again, the travel time depends on the distance and the means of transport.

Once the crude oil arrives at the refinery, it is stored in a crude tank. On average, a barrel of crude oil would be in the storage tank for two days, but this can vary depending on the refinery's production capacity. The actual refining process is very quick. Once the crude oil enters the distillation tower, it is transformed into gasoline in four to eight hours, depending on the technology in place. After production, gasoline is stored in a product holding tank for one or two days while it waits to be transported to service stations.

The location of the eventual retail outlet determines how the gasoline will be transported. In our Edmonton example, if the service station is located in Edmonton, the product will be picked up by truck and delivered to the retail outlet within a day. If the service station were located in Winnipeg, the gasoline would have to be transported by pipeline the 1,300 kilometres from the refinery. This would take four to five days. Once in Winnipeg, it would be stored in another product holding tank one to two days before delivery by truck to retail outlets in the city. Once the gasoline is delivered to the service station, it is stored in underground tanks until the motorist is ready to fill up.

In anywhere from one to four weeks, crude oil can go from being taken from the ground to being gasoline in the tank of your car.

Venezuela. Currently, oil production in Iraq is not at full capacity because oil sales are permitted only to finance "humanitarian" purchases. OPEC members together represent about 40 per cent of the world's oil production. They try to maximize the long-term benefit to be derived from their resource by influencing world supply and expectation of supply by controlling the production levels of their members. While some dissent among members and the actions of non-members often weaken OPEC's position, no other country or group exercises as much influence on crude oil prices. Non-OPEC producers, such as Mexico, Norway, the United Kingdom and the United States, are also important suppliers to the Canadian market. However, while these producers exert some influence on prices, the dominant force remains OPEC. OPEC's production cutbacks are the main cause of the recent volatility in Canadian pump prices.

Wholesale

Industry Structure—Refineries

The petroleum refining sector is the manufacturing stage of the gasoline production process. Refineries take crude oil and manufacture a range of refined petroleum products, including gasoline, diesel, heating fuels, jet fuels and lubricants. The mix of products produced is called the product slate. Different products are produced at different temperatures or during different stages of the refining process. Gasoline is the largest single product; it comprises about 40 per cent of total refinery production.

Canada currently has 21 refineries. Three of these refineries, located in Sarnia, Lloydminster and Moose Jaw, do not manufacture fuels. Therefore, 18 refineries in total (see Table 1) manufacture gasoline and other distillates, mostly for domestic consumption but also for export. All of the output from the North Atlantic refinery in Come By Chance, Newfoundland, is either used domestically in Newfoundland or else exported to non-Canadian markets. This is because of a restrictive covenant signed by the purchasers of Come By Chance when the mothballed refinery was bought from Petro-Canada and reopened.

The modern refinery is a sophisticated work of engineering with a high capital cost that typically involves an investment of over \$1 billion, excluding property costs. Plant operations are similarly costly and involve high levels of energy, labour and maintenance. In addition, refineries require regular upgrading and high investment to maintain worker safety and meet changing environmental standards and new regulations. While there are a number of different refineries, the two major types are referred to as coking and cracking. Both refineries take crude oil and produce gasoline and other fuels. However, the coking refinery requires larger investments because it has the capability of producing more lighter-end products (e.g., gasoline) from a barrel of heavier crude oil. Cracking refineries, which are the dominant type in Canada, have not made the investment to process heavier crude and, as a result, rely on lighter (and subsequently more expensive) crude oil.

The refineries in Quebec and Atlantic Canada are cracking refineries. They rely primarily on the lighter imported

Table 1
Gasoline-Producing Refineries in Canada

Company	Refinery location	Capacity (barrels of crude per day)
Imperial Oil	Dartmouth, N.S.	84,000
Irving Oil	Saint John, N.B.	237,500
North Atlantic Refinery	Come By Chance, Nfld.	99,750
Ultramar	St-Romuald, Que.	155,000
Petro-Canada	Montreal, Que.	105,000
Shell	Montreal, Que.	129,900
Imperial Oil	Nanticoke, Ont.	112,000
Imperial Oil	Sarnia, Ont.	122,000
Petro-Canada	Oakville, Ont.	83,000
Shell	Sarnia, Ont.	71,400
Suncor	Sarnia, Ont.	82,400
Co-op	Regina, Sask.	52,000
Imperial Oil	Edmonton, Alta.	179,600
Parkland Industries	Bowden, Alta.	6,000
Petro-Canada	Edmonton, Alta.	120,000
Shell	Scotford, Alta.	94,350
Chevron	Burnaby, B.C.	52,000
Husky Oil	Prince George, B.C.	10,250
Total		1,796,150

Source: Natural Resources Canada.

crude oil from the North Sea and the Middle East. Two coking refineries in western Canada can process the heavier crude oil extracted from Alberta and Saskatchewan. The proportion of light conventional crude oil from western Canada declined from 51 per cent in 1985 to 33 per cent in 1999. This drop has been offset by the increased production of non-conventional crude from the oil sands in northern Alberta.

The United States, by contrast, has a total of 163 refineries, with a combined capacity of 15.4 million barrels per day of crude. Of that capacity, coking refineries produce 1.8 million barrels per day. In comparison, Canada has a coking capacity of only 39,000 barrels per day.

Twenty Canadian cities across the country have bulk terminals where marketers can purchase gasoline at the posted rack price and then deliver it to their retail outlets or other clients by truck (see Exhibit 4). Some of the terminals are located at the refinery site, while most are located at storage facilities where gasoline is received from product pipelines. It should be noted that not all refiners offer gasoline at the wholesale level. Gasoline

production at the Irving and Chevron refineries, for example, is generally limited to supplying branded stations of these two refiners.

Rationalization

The 18 fuel refineries that currently operate in Canada represent a significant change. In the early 1980s there were 40 refineries, and in the 1970s there were 58. The extensive rationalization was a result of decreased profitability due to under-utilized capacity, increased competition and reduced demand for gasoline. Throughout the early 1980s, demand for gasoline dropped sharply due to weak economic conditions and high crude prices following the oil price shocks in 1973 and 1979. Gasoline consumption in Canada fell by 18 per cent between 1981 and 1987. In the late 1970s and early 1980s, demand for heating oil fell as well because of increased competition from natural gas and electricity. Also, the fuel efficiency of most cars improved, and this too

Exhibit 4
Bulk Fuel Terminals in Canada that Post Rack Prices

City	Company
Saint John, N.B.	Esso, Petro-Canada
St. John's, Nfld.	Ultramar
Halifax, N.S.	Esso, Ultramar, Petro-Canada
Quebec City, Que.	Esso, Ultramar, Shell, Petro-Canada, Olco
Montreal, Que.	Esso, Ultramar, Shell, Petro-Canada, Olco
Ottawa, Ont.	Esso, Ultramar, Shell, Sunoco, Petro-Canada, Olco, Coastal
Toronto, Ont.	Esso, Ultramar, Shell, Sunoco, Petro-Canada, Olco
Hamilton, Ont.	Olco, Sunoco
London, Ont.	Esso, Ultramar, Shell, Sunoco, Petro-Canada, Olco
Sarnia, Ont.	Esso, Ultramar, Shell, Sunoco, Petro-Canada, Olco
Thunder Bay, Ont.	Petro-Canada
Winnipeg, Man.	Esso, Shell, Petro-Canada
Regina, Sask.	Esso, Shell, Petro-Canada
Calgary, Alta.	Esso, Shell, Petro-Canada
Edmonton, Alta.	Esso, Shell, Petro-Canada
Kamloops, B.C.	Esso, Shell, Petro-Canada
Vancouver, B.C.	Esso, Shell, Petro-Canada
Nanaimo, B.C.	Petro-Canada
Victoria, B.C.	Esso
Barepoint, B.C.	Shell

Source: Bloomberg.

reduced the demand for gasoline. After 1987, the demand for it slowly started to recover and increased gradually during the early and mid-1990s. Demand continued to pick up in the latter part of the decade.

Between 1970 and 1979, 18 refineries were shut down in response to weak demand and declining margins. Another 10 closed their doors in the 1980–84 period. In 1991, Petro-Canada closed the Taylor and Port Moody refineries in British Columbia and crude-processing units at its Mississauga refinery. Shell closed its Burnaby refinery and Esso closed its refineries in British Columbia and the Northwest Territories. In the early 1990s, Ultramar also closed its refinery in Halifax.

In the present decade, the biggest challenge facing the refining industry is environmental regulations. Huge investments will be required, incurring costs that must be recovered by the refiners. The most recent of these regulations came into effect in 1999, requiring lower benzene limits in gasoline. Canadian gasoline benzene specifications now exceed those required in many countries, including Japan, and most regions of the United States.

In 1999, the federal government passed legislation restricting the level of sulphur permitted in gasoline. This will be accomplished in two steps. Step 1 restricts the level of sulphur to an average of 150 parts per million in the period from July 2002 to December 2004. The second step requires reducing the level of sulphur to an average of 30 parts per million by January 1, 2005. To meet these standards, the refiners will have to invest approximately \$1 billion over the next few years. The United States will be imposing similar sulphur standards. However, it will be phasing them in over a longer period of time.

Wholesale Gasoline Prices

A key pricing activity for the refiners is setting the approximate wholesale price that retailers pay for gasoline, or what is referred to as the posted rack price for gasoline. The rack price provides a reference for the wholesale price of gasoline purchased at the terminal locations. There are usually between three and five different companies that post rack prices at each

terminal. Rack prices are reviewed on a daily basis at each terminal, with changes generally made two to three times a week. The refiners provide rack-pricing information to their customers either directly or in the *Bloomberg Oil Buyers' Guide* publication, OPIS (Oil Price Information Service), Reuters, as well as other industry services.

The integrated petroleum companies give their largest customers—independent branded or unbranded dealers, wholesalers and big box operators—discounts from the posted rack prices. These are based on the customers' volumes and long-term supply arrangements. The discount values can be affected by other factors as well. For instance, if the supplier has too much inventory in a terminal and faces a containment problem, the discount may be increased in order to move the product quicker and reduce inventory levels. The reverse may occur in the case of a supply shortage. During a price war, discounts to branded retailers may be increased to ensure a minimal margin to the dealer while allowing him/her to remain competitive. Discounts are not made public and are subject to negotiation between the wholesaler and the customer.

The integrated petroleum companies provide many of their own stations with product that remains theirs until the customer purchases it at the pump. It is therefore difficult to determine the actual wholesale value of this product, as the rack price does not apply. Major integrated companies use an internal market acquisition price for this product, which has some relationship to rack price as well as volume discounts. However, this information is proprietary to the companies themselves and not made public.

Exhibit 5 Rack Prices

Rack price is used as a proxy for the wholesale price of gasoline throughout this report. The weakness of this assumption, however, should be clearly recognized. Eighty-two per cent of the gasoline sold in Canada is sold through branded outlets (Kent Marketing), whose acquisition price is likely to be different from the rack price. In addition, as outlined above, large-volume independents may also receive a discount from the rack listing. As a result, the rack price applies to only a small portion of wholesale gasoline sold in Canada. Nevertheless, rack prices are the only readily accessible data on wholesale prices, and trends in rack prices represent movements in wholesale prices.

Every day, each supplier of wholesale gasoline determines what the appropriate rack price should be for their terminals. The factors that are considered in the setting of their rack price include:

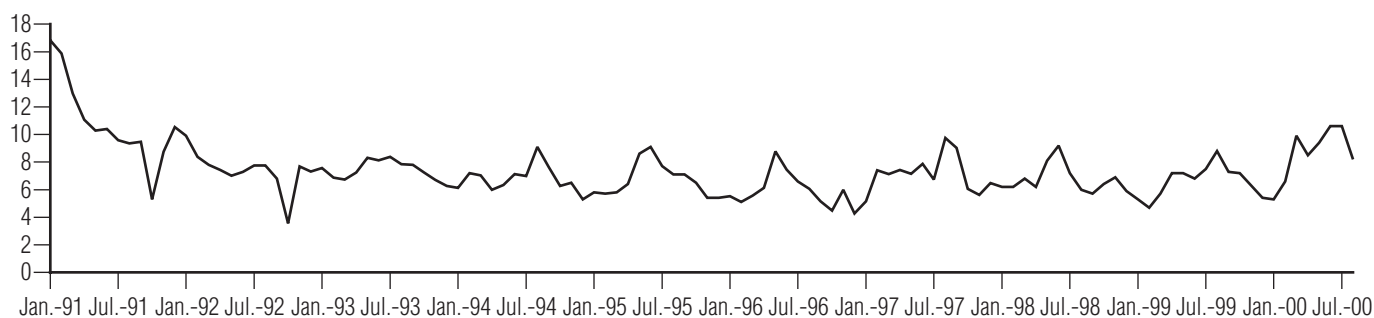
- **Crude Oil**—The crude oil price is generally established at New York harbour. Possible changes to the underlying trend in crude are monitored closely by the majors.
- **Refiner Margin**—The refiner margin is the difference between the price of wholesale gasoline and crude oil and is also referred to as the crack margin. High or low refiner margins provide a good indication of supply conditions in the different markets across the country. For instance, a high refiner margin would indicate that supply is tight in a particular market. This factor is an important input into determining what the daily rack price should be. Average refiner margins in Canada are shown in Chart 1. Much of the fluctuation in the refiner margins is likely caused by factors of seasonality, given the technology of producing fuels. Demand for gasoline is much higher in the summer months. Gasoline is often in excess supply during the fall and winter months as large amounts of gasoline are produced as a by-product of the refineries' concentration on home heating fuel supply.
- **Competing Posted Rack Prices**—The majors also consider the rack prices of their competitors when determining the appropriate price. These prices are publicly available through the many services to which most wholesalers subscribe. Competitors' rack postings sometimes differ due to the unique market conditions that a particular competitor has to contend with or to

their different interpretations of the direction of market forces. However, due to the high sensitivity of gasoline demand to price changes, posted rack prices generally are very similar to each other.

- **U.S. Rack Locations**—For terminal locations in eastern Canada and the lower mainland of British Columbia, the U.S. rack price is probably the most important factor in determining their own rack prices. Demand for wholesale gasoline is extremely price sensitive and, as a result, if rack prices in Canada are not competitive, customers can import gasoline from the U.S. border rack locations. In the case of Ontario, border rack locations such as Buffalo, Detroit and Duluth are viable alternatives for customers wishing to obtain gasoline. In Quebec and Atlantic Canada, the rack price in New York harbour is closely watched. The import alternative is not as important a factor in the three prairie provinces because of the greater distances involved. Consequently, factors like crude oil costs and crack spreads are more important in determining rack prices. In Vancouver, however, where imported product is a viable alternative, the U.S. rack price in Seattle must be monitored on a daily basis.

In general, U.S. rack prices are the most important consideration in determining Canadian wholesale prices. Gasoline products can be freely exported and imported between Canada and the United States. The result is that the wholesale industry regards American product and American refineries as its competition. As a result, prices are also determined by supply and demand factors in the relevant

Chart 1
Average Refiner Margin in Canada
(cents per litre)



Source: M.J. Ervin.

Exhibit 6

Import Alternatives

It is well known that Canada both exports and imports crude oil. At the same time, refined product, such as gasoline, crosses the border freely between Canada and the United States.

In 1999, Canada exported almost 6 billion litres of gasoline while importing over 2 billion litres. Most of Canada's gasoline trade is with the United States. Exports are particularly heavy in the winter months, when an excess supply of gasoline is produced in Canada as a by-product of accelerated home heating oil production. Imports tend to be more significant in the summer months when Canadian demand is highest.

The fact that Canada and the United States exchange gasoline supports the Canadian refiners' need to remain competitive with their American counterparts. If Canadian rack prices for gasoline were significantly higher than rack prices in neighbouring U.S. markets, Canadian refineries could lose much of their business to imports, and could become economically unviable.

For independent gasoline distributors in Canada, an available import alternative allows them a supply option other than that presented by the relatively concentrated Canadian refining industry.

For consumers, the U.S. import alternative and the Canadian wholesale industry's need to remain competitive on a continental basis translate into competitive prices at the rack level, which in turn lead to lower prices at the pump.

U.S. markets rather than only by conditions in Canada. For example, in early 2000, the northeastern coast of the United States experienced colder-than-average conditions, which resulted in an increased demand for, and production of, heating oil and thus reduced available supplies of gasoline. This resulted in a sharp increase in northeastern U.S. rack prices for gasoline. Although central Canada had a much milder winter, gasoline prices were nevertheless pushed up as a result of the high U.S. prices.

From the consumer's point of view, this continental competition results in wholesale prices that are influenced by the much larger U.S. market rather than by just the limited number of players who operate within the Canadian refining industry.

The decision to change the rack prices is based on the trends in the U.S. rack prices, crude oil and crack spreads. Sometimes the indicators all move in the same direction and, consequently, the new setting for the rack price is relatively straightforward. However, in many cases, the indicators move in different directions and a great deal of judgement may be required to establish a competitive rack price.

Refiner Margins

Refiner margins declined in Canada in the early 1990s, stabilized from 1993 to 1999 at an average of around 7 c.p.l. and have been rising since the beginning of 2000 (see Chart 1). Profitability has been maintained by rationalization and a drastic reduction in operating costs as opposed to increased product prices. Because the wholesale price in Canada is in large part influenced by U.S. wholesale prices and crude prices are determined on world markets, the refiner margin in Canada is heavily influenced by outside factors, as opposed to internal costs.

Chart 2 shows a comparison of Canadian and American refining margins. Their relationship is clearly visible, and the difference in margins is due to the cost of transporting the import alternative. The increase in U.S. margins in mid-2000 reflects the introduction of reformulated gasoline into selected U.S. markets. Reformulated gasoline (RFG) is a general term for federally mandated gasoline in the United States that is specially processed and blended to reduce the emission of pollutants such as hydrocarbons, toxics, and nitrogen oxides. When compared to typical gasoline, RFG reduces hydrocarbon emissions by at least 15 per cent, according to U.S. Environmental Protection Agency estimates.

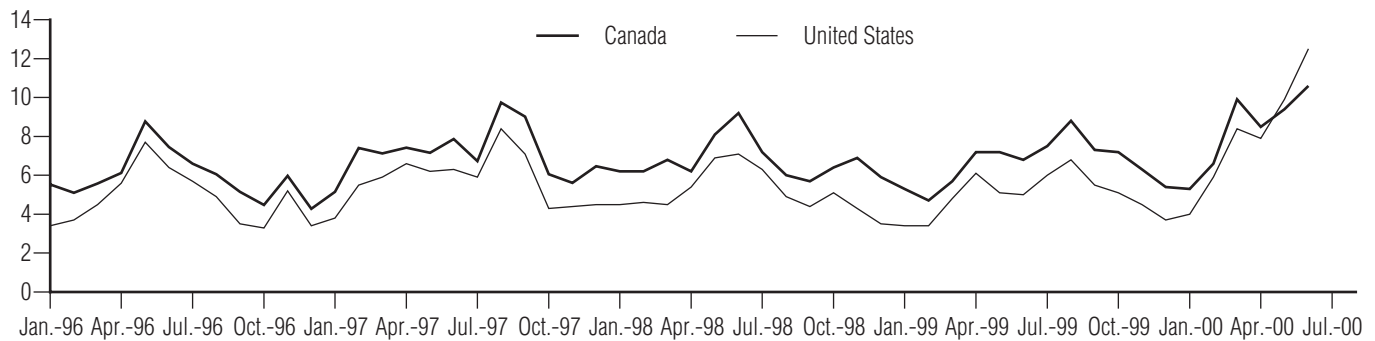
Empirical Analysis of Wholesale Prices

The empirical analysis confirmed the finding that changes in U.S. rack prices are closely linked to changes in Canadian wholesale prices (see Appendix B). The change in wholesale prices for 11 Canadian cities were regressed on the change in wholesale price in New York. The results indicate that the U.S. wholesale price, both present and lagged one month, are significant in explaining the movement in wholesale prices for all 11 cities. For most of the cities, the results revealed that a one cent (Canadian) per litre increase in wholesale prices in the United States eventually led to a one cent per litre increase in Canadian wholesale prices. The close relationship between Canadian and U.S. wholesale prices is not surprising. The majors and regional refiners in Canada closely monitor U.S. wholesale prices and set their prices to attempt to remain competitive with imported gasoline. If Canadian wholesale prices were not competitive with

Chart 2

Refiner Margin Comparison: Canada vs. United States

(cents per litre)



Sources: M.J. Ervin and U.S. Energy Information Administration.

U.S. prices, imported product would flood the Canadian market and hurt the refinery business in Canada.

Stakeholder Concerns

Implications of a Continental Wholesale Market

Independents, in particular, are concerned about a perceived lack of competition in the wholesale market for gasoline in this country. Generally, their complaints centred on two specific areas: pricing and access to supply.

In eastern Canada, the majors set their rack prices at a level designed to remain competitive with imported product. Some independents believe that rack pricing based on this formula places them at a competitive disadvantage. These independents argue that the posted rack price in Canada would have to be higher than in the United States if the rack prices set by the majors were based on their costs. They assume that all Canadian refineries have higher unit costs than their U.S. counterparts, an assumption that cannot be proven. As a result, they contend, the retail prices at the stations run by the majors would be higher. This would then enable the independents to import product from the United States at a cheaper rack price and have a slight advantage over the majors at the retail level.

If the majors based their rack prices on cost as opposed to the import alternative, it might be possible for the independents to gain a competitive advantage, depending on

the market conditions. However, from the majors' point of view, pricing to keep imported product out of their markets makes sound economic sense. Imports reduce the demand for product from their refineries and could potentially damage that portion of their overall business.

The fact that the rack price in Canada is highly influenced by economic conditions in the United States leads to some pricing decisions that, at first glance, would seem to place the industry in Canada at a disadvantage. In March 2000, for example, wholesale prices increased in the United States because of tight inventories. Inventories in Canada were at reasonable levels at that time, indicating that a price increase was not required. Yet, because of the integration of the two markets, wholesale prices also increased in Canada. But if Canadian rack prices had not increased, U.S. marketers would have had an incentive to purchase product in Canada. This would have reduced inventories and would have eventually led to increasing rack prices until the price differential excluding transport costs between the two countries was eliminated. In the short term, though, Canadian retailers and consumers paid a higher price for their gasoline than they would have otherwise. It should be noted, however, that this pricing also benefits Canadian retailers and consumers when the reverse is true and U.S. inventories are high. When this happens, Canadian retailers pay lower wholesale prices than may be warranted by Canadian conditions.

The observation that rack prices may sometimes be set to keep out imports is a double-edged sword for

independents and motorists. While it denies independents a cheaper import alternative, it provides them with less expensive domestically refined gasoline. In short, it may keep importing independents from obtaining a competitive edge, but it also generally provides Canadians with lower gasoline prices than might be the case if the limited number of Canadian refiners did not have to contend with potential U.S. competition.

Uniformity of Rack Prices

The other major complaint about rack prices in Canada is that they appear to be nearly the same at each terminal and to move uniformly. Some stakeholders claim that this rigidity indicates that there is less competition in Canada than in the United States. They also contend that it is much more difficult to obtain discounts in Canada, especially when the independent dealer is not purchasing a large quantity of gasoline.

To a certain extent, the differences between the rack prices in Canada and the United States reflect the larger size of the U.S. market and the presence of many more competitors. However, from the perspective of the majors and regional refiners in Canada, the uniformity of rack prices within the markets across the country reflects the pricing formulae that are used to determine rack prices. All of the majors and regionals post their rack prices in some relationship to the same benchmark U.S. price and, given that gasoline is a homogeneous product, it is not surprising that they are similar. Local market conditions imply that a rack price posting that is significantly higher than the competition will result in a severe loss of business.

The move to rack postings in the mid-1990s significantly changed the market and made it much more difficult for the independent dealers to obtain discounts, although many operators still receive limited discounts. Prior to rack postings, it was possible for an independent to get a product's price from a major and then go to another major and negotiate a better discount. The posting of all rack prices prevented the independents from using a potential lever for them to attempt to negotiate a better deal.

Discounts

Discounts from the rack price as well as non-priced supplies of gasoline to refiner-owned retailers are contentious issues for many independents. They believe that while the rack price determines the cost of their supply, branded dealers have access to arrangements that are not subject to the same transparency as their pricing and, as such, rack prices do not necessarily represent the actual cost incurred by competing dealers. The implication is that branded retailers, as well as those who receive discounts, including independents, have higher retail margins than those actually estimated for statistical and analytical purposes.

Export Prices

Refineries export product to the United States, particularly in winter months when inventories are at high levels. In order to sell product south of the border, refineries must absorb some or part of the freight costs to ensure that the product is competitive in the U.S. market. As a result, depending on the market conditions, the export price is frequently lower than the domestic price. Some independents contend that, to be fair, the domestic rack price should be the same as the export price. However, if the domestic price matched the export price, the refinery would potentially lose money.

Product Supply

Many independent stakeholders contend that one of their biggest problems is obtaining a reliable supply of product from the terminals across Canada at a competitive price. The problem is viewed as more serious in western Canada. The Prairies have limited import options into Winnipeg, and importing product to this region is more expensive than to other parts of the country. Independent dealers in this part of the country regard long-term contracts with major oil companies or regional refiners as a necessity in order to remain in business. A frequently heard comment was that, while independents have not yet encountered serious problems obtaining supply, in a crunch the majors would look after their own interests and leave their independent customers in a lurch. However, this claim was not substantiated by the past behaviour of refiner-marketers.

Even in eastern Canada, where the import alternative is viable, independents reported problems in being able to obtain product supply from outside Canada. Detroit is an excellent source of imported product because it is regarded as a very competitive market. However, the only option for the independents to obtain supply from this market was by truck since there is no product pipeline from Detroit to Sarnia. Since trucking product to the heartland of Ontario is more expensive than supplying it by pipeline, the majors can account for this factor when they determine their rack prices. It was noted that a public pipeline from Detroit into Canada would ease the difficulties that some of the independents encounter in obtaining product. Buffalo, another alternative market for imported product, was not regarded by some independents as being viable because it is a very uncompetitive market dominated by one supplier.

Difficulties in obtaining imported product from the United States are likely to intensify due to Canadian environmental laws. Restrictions on the amount of benzene in gasoline may make it difficult for Ontario independent retailers to import from Michigan since their product does not meet Canadian federal guidelines. In addition, changes to sulphur content regulations that are not in step with the U.S. regulatory timetable may also seriously hamper the supply of alternative product from the United States.

Tax Collection

Major and regional refiners have an advantage over independents in terms of tax collection. Independents must pay the excise taxes (federal and provincial) on gasoline immediately upon delivery of wholesale product. On the other hand, branded dealers pay the excise taxes only after the product is sold at the retail level. This provides the branded dealers with a cash flow advantage over the independents.

Refiner–Independent Retailer Interface

In consultations with stakeholders, it became clear that serious problems are seen to exist between refiners and independent retailers.

Canada has a limited number of refiners who sell their product at the wholesale level. All these refiners are

also involved in retail operations that directly compete with their independent customers. This situation differs significantly from the U.S. situation where multiple suppliers exist, many of whom operate exclusively at the wholesale level.

Independents believe that Canadian refiners do not actively compete for their business and set rack prices in order to prevent independents from obtaining alternative supply. In addition, they contend that branded dealers are regularly provided with product at preferential prices or guaranteed margins that give them an unfair advantage at the street level. Because negotiated contracts are confidential, it is impossible to know the real acquisition price paid by retailers.

Retail

Industry Structure—Retail Sites

There are currently close to 13,250 retail outlets selling gasoline in Canada, down from 22,000 in 1989. This represents a reduction of just under 40 per cent. This mirrors the experience in the United States where the number of gasoline outlets diminished by almost 45 per cent, from 279,000 in 1972 to 155,000 in 1992.

The competitors in the retail gasoline market are many and varied. The current make-up of the retailers is as follows:

- Two integrated refiner/retailer multinationals—Esso and Shell. These companies are also involved to varying degrees in oil exploration and production, although they are net purchasers of crude oil.
- One national integrated refiner/retailer—Petro-Canada. Petro-Canada is also an oil producer, but its production does not meet the requirements of its refineries so it must buy crude oil from other suppliers.
- At least one integrated refiner/retailer in each major region in Canada—Ultramar, Irving, Sunoco, Chevron, Arco, Husky, Federated Co-op and Parkland. All of these companies, with the exception of Irving, Federated Co-op and Parkland, are part of large integrated companies that are also involved in oil exploration and production worldwide. Husky, however, is the only company that is self-sufficient in its Canadian oil production.

- A number of big box store retailers, such as Canadian Tire, Real Canadian Superstore, Save-on Foods and Costco.
- A large number of small independent retailers.
- A number of private branded distributor networks such as Wilson's Fuel, Mr. Gas and Domo.

According to Kent Marketing's city-based data, the decline in the number of retail outlets in the 1990s was led by the majors, down 36 per cent, and the regionals, down 25 per cent, while the independents declined by 10 per cent. The proportion of sites for the independents increased from 26 per cent to 32 per cent between 1990 and 1999, while the proportion for the regionals and nationals either declined or remained flat. There are a number of factors behind the increased proportion of sites for the independents, some of which include:

- The increased involvement of convenience stores, which often brand under their own names, in gasoline marketing.
- The rising number of grocery store chains and other types of marketers offering gasoline.

Several independent chains experienced strong growth in sales in the late 1990s through the acquisition of smaller independent chains. At the same time, independent chains have been slower to close stations than the majors. While the proportion of stations they own may have increased in some markets, their sales volumes per outlet are significantly smaller than those of the refiner-marketers.

Retail Modes of Operation

The retail gasoline infrastructure involves two main stakeholders: the supplier and the dealer. The supplier, whether it be a refiner-marketer or an independent chain, holds initial title to the product as it leaves the terminal and may also own the brand name at the retail outlet, while the dealer manages the day-to-day operations of the outlet. Several possible relationships exist between the retail dealers and their suppliers, including:

- *Company Operated*—The supplier owns the retail outlet, and the dealer and attendants are salaried employees of the supplier. The supplier determines the pump price. Only 10 per cent of all Canadian outlets are company operated.

- *Commission Operated*—The outlet facilities and inventory are owned by the supplier, but the dealer is paid a commission generally based on the volume of gasoline sold at the outlet. Again, the supplier determines the price. Thirty-two per cent of Canadian service stations are operated in this fashion.
- *Lessee*—The supplier owns the outlet facilities, which are then leased out to the dealer. The lessee (dealer) purchases gasoline from the supplier and then resells it to the customer at a price established by the lessee. Only 12 per cent of gasoline outlets in Canada are lessee operated.
- *Independent Dealer*—The dealer owns the retail facilities and purchases the gasoline from a supplier, and then resells at a dealer-established retail price. Independent dealers make up 46 per cent of the Canadian retail gasoline market.

In the first two relationships, it is important to note that the gasoline belongs to the supplier until it is sold. This has important implications for what the actual retail margins for such stations are. In the case where the dealer purchases the gasoline, the purchase price is clearly established at that point. Usually it is the wholesale price, or some price discounted on the basis of arranged volumes or long-term negotiated supply. This helps define the retail margin, which is the difference between the selling price and the rack price. Under supplier-owned or consignment arrangements, the actual price paid for the gasoline is less clear and may distort the actual margin that the retailer receives. There are also tax implications in the relationship. Independent retailers pay tax when they receive their product. Consignees are responsible for the tax only when they actually sell the product to the customer.

While the relationship between the supplier and retailer may vary from station to station—and the ownership of the product may, too—it is important to note that all retailers are operating in the same market. As a result, the actions of any one retailer can have a major impact on the pricing decisions of all their competitors, regardless of ownership structure. Technically, 58 per cent of retailers are able to set their own price. However, they cannot ignore the price-setting activities of the other 42 per cent of outlets for which the suppliers fix prices.

Exhibit 7 Branded Independents

Forty-six per cent of retail gasoline outlets in Canada are operated by independents, 70 per cent of which have no affiliation with a refining operation. Therefore, 14 per cent of Canadian retailers are independents affiliated with a major or regional refiner.

The situation of these branded independents is both similar to and different from other Canadian gasoline retailers. Like other independents, branded dealers own their facilities and purchase the gasoline from their branded supplier and sell it at a price that they appear to determine themselves, but which is really established by market conditions. Branded independents usually have three-to-five year contracts to carry a certain banner. However, the supplier may cancel these contracts at very short notice, often less than 30 days. With the dramatic rationalization of outlets by majors over the past two decades, many branded independents have found themselves with their contracts cancelled and scrambling to find an alternative supplier or to exit the business completely. This cancellation of contracts may be even more marked when their supplier upgrades a nearby company-owned facility into a high-volume, low margin superstation.

Branded independents have been subject to changing arrangements with their suppliers over the past decade. Their supply price is based on a branded rack price that is higher than the listed price (although discounts usually apply). Charges once borne by the supplier have now been passed down to the retail level, including credit card costs and loyalty-program expenses over which the retailers themselves have no control. In addition, with the high degree of competition at the street level and marketing practices such as zone pricing, branded independents claim they seldom are able to truly determine their prices or make an adequate return on their time and investment.

Per Outlet Sales Volumes

Although independents increased their proportion of retail sites in the 1990s, a different picture emerges when examining average sales volumes per station or throughputs. The market share of volume for the independents declined from 23 per cent in 1990 to 18 per cent in 1999.

Over the sub-period 1995–99, the majors' market share increased slightly from 56.5 per cent to 58.6 per cent, while the regionals grew to 23.4 per cent from 19.7 per cent. The regionals' market share increased due in part to their acquisition of independent chains. Because of this, the independents' share dropped from 23.7 per cent to 18 per cent. However, some of the larger independents, including Pioneer, managed to retain their market share during the 1995–99 period while others lost market share. Pioneer, however, is a special case. While its actions and pricing policies are consistent with those of an independent, it is 50 per cent owned by Sunoco, a regional refiner, with whom it has a supply arrangement.

The changing role of independents can also be seen by examining how the average sales volume per station changed during the 1990s. Table 2 shows the average throughput figures at both the national and regional levels. Chart 3 shows the change in average throughput for majors, regionals and independents between 1990 and 1999.

The decline in the number of outlets selling gasoline during the 1990s, combined with a 16 per cent increase in sales volumes, naturally resulted in a significant gain in average throughput per outlet. At the national level, average throughput increased by almost 65 per cent, from 1.95 to 3.2 million litres. Every region of Canada recorded an increase in average throughput in the 1990s. Quebec and Atlantic Canada showed the lowest increase at about 47 per cent and Ontario the highest at approximately 80 per cent. Most of the majors and regionals managed to sell more gasoline in the 1990s, even though some reduced the number of outlets by close to 40 per cent. On average, the traditional independents have much lower throughputs than the major refiner-marketers. (See the section "Comparison of Canadian Centres.")

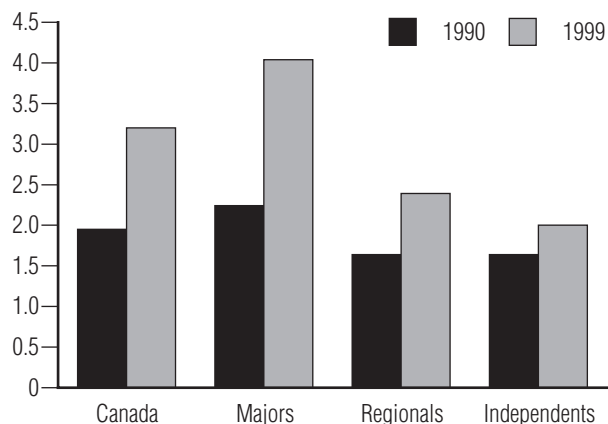
Chart 3 shows how majors have led the rationalization of retail outlets and the important impact rationalization has had on their average station throughput in the 1990–99 period. Neither regionals nor independents have kept pace with the majors' rate of increase. As a result, the average throughput of a major compared to that of an independent retailer has increased from 36 per cent more in 1990 to 102 per cent more in 1999. In the United States, the U.S. Energy Information Administration reports that the average sales volume for all stations,

Table 2
Average Outlet Throughput by Region
(millions of litres)

Region	1990	1995	1999
Atlantic	1.64	1.98	2.41
Quebec	1.59	1.97	2.36
Ontario	2.36	3.32	4.25
Prairies	1.83	2.36	2.85
British Columbia	1.96	2.73	3.31
Canada	1.95	2.58	3.20

Source: Kent Marketing.

Chart 3
Average Throughput per Station
 (millions of litres)



Source: Kent Marketing.

including majors, regionals, convenience stores and jobbers, was 4.02 million litres in 1998. The comparable figure in Canada was 3.20 million litres. The most efficient outlets in southern Ontario operate at a par with equivalent U.S. stations, selling about 6 million litres per year. The fact that throughputs in most other regions are lower in Canada reflects the different population densities and the geography of the country.

Ancillary Revenues

Another major structural change in the industry over the past 10 years has been the growing importance of ancillary revenues from convenience stores, fast-food restaurants and car washes. Petro-Canada, for instance, reported that sales of non-gasoline products have increased by close to 40 per cent since 1992. Gasoline stations have evolved over the years into outlets with multiple product and service lines. Convenience stores at many of the larger stations offer an array of grocery products and, in some sites, bakeries, video rentals and banking machines, as well as other goods and services. The proliferation of convenience stores is designed to generate non-gasoline revenue since greater sales of other goods and services are required to offset declining gasoline margins and to help cover fixed costs. The importance of ancillary sales becomes evident when site economics are taken into account.

Site Economics

Throughput is not the only measure of a retail gasoline operation's viability. Efficiency of operation, the role of ancillary activities and incomes and a fair return on investment are also important factors. A major concern of independents in particular is the sustainability of their stations as stand-alone operations. Table 3 shows a typical operating statement for three different types of operations.

Site A represents a high-volume urban outlet in a population centre of over 150,000 with an average gasoline throughput of 8.5 million litres per year. Site A has a convenience store with high sales but relatively low convenience store margins (9.2 per cent).

Site B is located in a small-town secondary market not too far from an urban centre with a population of less than 75,000 and a gasoline sales throughput of 4.9 million litres. Site B has both a small convenience store as well as a fast food outlet. Convenience store margins are 13 per cent of sales, although the volume of sales is less than 40 per cent of that of Site A.

Site C is a rural outlet located in an area with a population of between 10,000 and 25,000, with a relatively low throughput of 2.8 million litres. Site C also has a convenience store of moderate size with healthy ancillary margins of over 22 per cent of sales. Sites B and C are situated within competitive distance of Site A, and their margins are therefore similar, being in the 6-6.4 c.p.l. range.

These tables illustrate the types of fixed and variable costs faced by operators. They also show the increased importance of ancillary sales, particularly in the face of low gasoline margins. All sites are dependent to a greater or lesser degree on ancillary sales in order to meet fixed costs.

While the table shows three independent operators, costs for majors and regional refiner-marketers would probably be similar, with higher costs for advertising and promotion and possibly higher corporate costs.

Table 3
Actual Service Stations in Eastern Canada

	SITE A	SITE B	SITE C
Annual volume (litres)	8,467,610.00	4,945,795.00	2,812,902.00
Retail margin (c.p.l.)	6.29	6.05	6.43
Gross fuel margin	\$532,613.00	\$299,221.00	\$180,870.00
Convenience store sales	\$1,258,703.00	\$475,003.00	\$749,572.00
Gross margin-c-store	\$116,159.00	\$63,999.00	\$167,971.00
Fast food rental		\$53,371.00	
Total gross margin	\$648,772.00	\$416,591.00	\$348,841.00
Site operating costs			
Wages	\$112,884.00	\$97,782.00	\$85,415.00
Benefits	\$11,500.00	\$10,794.00	\$6,733.00
Heat, light, power, taxes	\$13,232.00	\$18,860.00	\$29,981.00
Advertising & promotion	\$37,312.00	\$19,849.00	\$722.00
Cash over/short	\$4,624.00	\$4,142.00	(\$3,428.00)
Credit card charges	\$36,369.00	\$23,968.00	\$14,943.00
Vehicle expenses	\$4,688.00	\$1,322.00	\$2,707.00
Other	\$18,058.00	\$9,353.00	\$9,169.00
Maintenance	\$25,730.00	\$18,361.00	\$9,179.00
Site operating profit (gross)	\$384,375.00	\$212,160.00	\$193,420.00
Service: General & administration (avg. corporate)	\$101,611.00	\$59,350.00	\$33,755.00
Site operating profit (net)	\$282,764.00	\$152,810.00	\$159,665.00
Capital			
Land	\$265,000.00	\$220,000.00	\$100,000.00
Building	\$430,000.00	\$655,000.00	\$475,000.00
Equipment	\$325,000.00	\$240,000.00	\$85,000.00
Working	\$73,500.00	\$68,325.00	\$72,300.00
TOTAL	\$1,093,500.00	\$1,183,325.00	\$732,300.00
Simple return before tax	25.9%	12.9%	21.8%
If retail margin were 4.5 c.p.l.	12.0%	6.4%	14.4%
If retail margin were 3.5 c.p.l.	0.4%	0.2%	8.6%

Source: IRGMA.

Retail margins clearly affect viability. The operating statement would change if the retail margins on gasoline were to decline.

At a margin of just over 6 c.p.l., all three sites are viable, returning pre-tax profits of between 13 and 26 per cent on capital employed. If the margin is reduced to 4.5 c.p.l., sites A and C still provide a return of over 10 per cent. Site B, with its lower volume and lower ancillary profits, provides a return of only 6 per cent. With a low 3 c.p.l. margin, the return on investment remains positive but barely break-even for Sites A and B. Only Site C, despite its low volumes but with its profitable convenience store operation, continues to provide a viable return of almost 9 per cent.

New Entrants in the Canadian Market

Prior to the 1990s, Canadian Tire was the main mass merchandiser that sold gasoline at some of its outlets. In the early 1990s, this changed as other retailers, such as Costco and various grocery chains, entered the market. The market penetration in western Canada is significant as there are currently over 40 mass merchandisers in different locations selling gasoline.

These new entrants are successful because they provide an extensive product service offering and a different approach to pricing compared with the traditional gasoline marketers. Many big box stores succeeded in gaining market share by pricing below the prevailing market price

or through price discounts in the form of coupons that are redeemable in the nearby store.

Traditional outlets offer gasoline as their primary product. Mass merchants offer a wide variety of consumer products, with gasoline as only a complementary product. Mass merchants charge competitive prices for gasoline to reinforce their low price image, since gasoline is viewed as a high-profile product. Petroleum is an ideal product to increase traffic since it is used by almost every customer and is purchased with a frequency that supports the mass merchandiser's other products. Cross-merchandising moves the gasoline customers into the store, and vice versa.

The phenomenon of the big box store is not only Canadian, it is global. Big box stores have increased their importance in the United States and have captured major market share in Europe. In the United Kingdom, grocery stores and other mass merchandisers peaked at close to 40 per cent of the market in the mid-1990s. Their share has fallen as traditional outlets have become more competitive. Nevertheless, mass merchandisers still control approximately 25 per cent of the U.K. market.

There is still a significant difference between Canada and the United States in terms of the penetration of supermarkets and big box stores into the retail gasoline business. Mass merchandisers are expanding their number of gasoline outlets, and the number of grocery store chains that have started marketing gasoline in the United States has increased. Large chain stores have carved out 5 per cent of the U.S. market and are expected to grow to 15 per cent within the next 10 years.

Big box stores may also make significant breakthroughs in Canada through the introduction of new technology. Unmanned fueling is not yet available in Canada due to zoning and safety requirements. This service has become available in parts of the United States and is likely to eventually be offered in Canada. Big box operators are generally on the cutting edge of technology and may gain an advantage in the market by introducing newer, more efficient technology.

Barriers to Entry and Exit

In the 1990s, the industry also experienced another structural change—increased costs to both entering and exiting the retail business. New environmental regulations make it more expensive to open a retail outlet because the underground tanks must meet strict guidelines. Also, some independents contend that it was more expensive to obtain credit in the 1990s because banks started to require an environmental assessment of existing sites before lending money to develop new outlets. The costly environmental assessments are necessary because the banks must ensure that existing sites are not a financial liability in the event that the potential borrower goes out of business. It can cost up to \$1 million to have an underground tank removed from a site if gasoline has seeped into the soil. This is mainly a problem for outlets built in the 1960s and 1970s, where tanks may have corroded over 20 or 30 years.

Entering the retail business is also more difficult because of lower retail margins that have been a fact of life throughout most of the 1990s. Low margins mean that a high throughput is required in order to attain a reasonable return on investment. Large throughputs require an excellent location as well as ancillary products, both of which require larger investments. In the 1980s, when margins were much higher, it was possible to enter or stay in business without as large a capital investment.

Capital requirements are large for entry: fixed facilities can cost up to \$2 million per location—excluding land costs—and inventories, start-up costs and customer credit also require extensive capital.

There are several other barriers to entry that may dissuade new retail entrants. Economies of scale currently exist in the industry that would force a new participant to enter on a large scale or else face serious price disadvantages. These economies are relevant for all areas of the industry, including production, distribution, research, marketing, human resources and financing. Brand identification and customer loyalty also work against new entrants.

Is it likely that any of the above factors will deter investment in new outlets? For the majors and mass merchandisers, the answer appears to be no. They have the revenue

base to spread the additional costs required to open a new outlet. Even some of the larger independents will not be deterred. Some independents plan to invest in new properties in the short term. However, higher entry and exit costs will likely deter the smaller operators who would find it difficult to obtain the credit to enter this business.

Regulatory Environment

Over the past decade, both the federal and provincial governments in Canada have introduced a number of environmental regulations. These include the requirement for low vapour pressure gasoline in the early 1990s and the requirement for low sulphur diesel in the mid-1990s. As mentioned earlier, the most recent legislation came into effect in 1999. It requires that the content of benzene in gasoline be limited to 1 per cent. In 1999, the federal government also passed a regulation restricting the level of sulphur permitted in gasoline in two separate phases. Step 1 restricts the level of sulphur in gasoline to an average of 150 parts per million in the period from

July 2002 to December 2004. The second step requires reducing the sulphur content to an average of 30 parts per million by January 2005.

Some jurisdictions in the United States also regulate the gasoline industry. In some cases, their laws are much tougher than the comparable laws in Canada, while in other cases the opposite is true. Canada does not yet require reformulated gasoline, as is the case in many urban centres in the United States, as well as the state of California. Reformulated gasoline (RFG) was introduced into one fourth of the U.S. marketplace with the purpose of reducing ground level ozone, or smog.

Two provinces in Canada regulate gasoline markets. Prince Edward Island controls the price of gasoline both at the wholesale and retail levels. In Quebec, the Régie de l'énergie monitors and regulates the minimum price for gasoline to ensure that it is not sold below cost. Also, the Régie has the power to determine and implement a minimum retail margin to cover the operational costs of outlets. To date, this provision of the law has never been applied. Other jurisdictions have attempted price regulation but have since abandoned these attempts.

In the United States in 1993, nine states had Motor Fuel Sales Below-Cost Laws prohibiting the sale of gasoline below cost. Today, a total of 23 states have General Sales Below-Cost Laws. A 1999 study of predatory pricing and state below-cost-sales statutes in the United States, written by Terry Calvani for the Competition Bureau of Canada, summarizes:

The economic literature concludes that state retail gasoline below-cost sales legislation has increased costs to consumers. Interestingly, such legislation appears not to have provided independent dealers either higher profits or greater stability. Thus the laws appear to come at a cost without the attendant benefit to the channel of distribution the legislation sought to protect.

A 1998 study found that gasoline prices were 2 cents (U.S.) per gallon higher in states that have specific gasoline sales-below-cost laws (Anderson & Johnson, *Antitrust and Sales-Below-Cost Laws: The Case of Retail Gasoline*).

Exhibit 8 Changing Environmental Standards

Most Canadians strongly support any steps that have the long-term goal of protecting our environment. However, changes in gasoline standards related to benzene and sulphur levels that are out of step with similar measures south of the border threaten to have a large impact on the gasoline industry in Canada as well as on the prices Canadian motorists pay for gasoline.

Currently, Canada's benzene standard is higher than that of the United States. Canada will soon be implementing sulphur content standards that are approximately two years ahead of similar U.S. standards. What will this mean for Canadians?

The lack of conformity in standards will mean that Canadians and Americans will be purchasing two different types of gasoline. Unless some U.S. refineries decide to undergo the expensive process of customizing their production for the Canadian market, imports will become less of a threat for Canadian refiners until U.S. standards fall in line. When California implemented emission standards that were more rigorous than those found in other U.S. states, California refiners could exert more control over prices and, as a result, that state's motorists experienced significantly higher pump prices. During 2000, the introduction of reformulated gasoline also resulted in a spike in gasoline prices in the U.S. Midwest. If Canada decides to increase its environmental standards beyond those of the United States, it will likely result in:

- an increase in Canadian refining costs to meet these new norms,
- a lessening of import opportunities for independent wholesalers,
- less competition for Canadian refiners and, consequently,
- increases in Canadian wholesale prices that will be passed on to the Canadian consumer.

A major difference between the two countries is U.S. state divorce laws. These laws stop refiners from owning and operating service stations. Currently, the United States has divorce legislation in five jurisdictions: Connecticut, Delaware, Maryland, Nevada and the District of Columbia. Neither Canada nor the provinces have divorce legislation (which would fall under provincial jurisdiction). U.S. studies have found that consumers derive no benefit from divorce laws. In addition, these laws have not stemmed the decline in retail outlets nor affected the composition of retail establishments.

Why Did the Gasoline Market Change in Canada?

In the 1990s, the retail gasoline industry experienced a reduction in the number of outlets, which enabled higher average throughput and greater reliance on ancillary or non-gasoline revenues at the retail site.

Twenty years earlier, the typical gasoline station included pumps and a service bay that provided car service and repairs. This model began to change in part due to the economic downturn caused by the OPEC-induced surge in oil prices in the early 1970s. In addition, the auto repair segment of the business became increasingly less attractive to the majors because of the competition provided by specialized repair shops, such as Canadian Tire, as well as extended warranties from automobile manufacturers. The majors and regionals began to invest in self-service stations in order to reduce average costs at each outlet. In 1973, the industry operated only 93 self-service stations, but by 1980, this number increased to 2,758. The total number of outlets began to decline rapidly in the 1970s as the majors closed five traditional stations for every new self-service station converted or opened up. Today, the vast majority of service stations in Canada and throughout North America are self-service.

The early 1980s recession and the increase in sales of fuel-efficient cars resulted in a significant decline in gasoline consumption. It declined by 18 per cent between 1980 and 1987. Not until 1999 did the volume of gasoline sold return to the 1981 level. The majors continued the drive to rationalize their operations—they reduced the number of outlets by 10 per cent between 1985 and 1990.

Their share of retail outlets fell from 61 per cent in 1985 to just less than 50 per cent in 1990, while their market share fell from 68 per cent to 54 per cent. The regionals and independents, on the other hand, increased their outlets to 25 per cent and 18 per cent of the market, respectively. In some cases they achieved this by taking over stations closed by the majors.

The increase in the number of outlets enabled the independents to increase their market share by volume from 21 per cent in 1985 to 26 per cent in the early 1990s. The average volume of gasoline sold at independent outlets increased as well, although it still lagged behind the average throughputs at outlets run by the majors. During this period, while the independents were increasing market share at the expense of the majors, they were also becoming relatively more inefficient. They were slower than the majors in upgrading their facilities, and their corporate planning does not appear to have taken into account the eventuality of lower margins. The ability to delay efficiencies was strengthened in the latter part of the 1980s by the return to healthy retail margins. As might be expected when profitability increases, this paved the way for new entrants into the market, such as mass merchandisers selling gasoline at their store locations.

In the 1990s, the drive for greater efficiency through increased throughputs continued. The majors recaptured the market share that they lost in the 1985–93 period by rationalizing their outlets and making significant investments to improve the throughput at their remaining or new stations. This included the construction of convenience stores and car washes. They competed aggressively on the price side and, consequently, as a result of the flexibility that their increased per outlet sales volumes gave them, retail margins began to decline. The independents also began to rationalize their operations and invest in convenience stores. However, most independents did not have the resources to construct \$2 million super-stations along the lines of the majors' new offerings. The independents had, in many cases, waited too long before rationalizing, and many could not obtain the resources to upgrade or overcome the barriers to entry and exit. As a result, their market share started to decline in the mid-1990s.

The Relationship among Competitors

Many Canadian consumers have expressed concerns about the relationship among Canadian oil companies. They believe that uniform gasoline price increases might be a by-product of this relationship. It is, therefore, important to examine the interaction that exists between the oil companies.

There is no evidence whatsoever that gasoline companies, whether they be major integrated refiner-marketers, regionals, or retailing independents, perceive their competitors as anything other than rivals for market share. That having been said, a strong degree of common interest exists among refiner-marketers, as it does among independents.

Refiner-marketers compete actively for market share. However, developments in the 1990s have brought about circumstances in which there is co-operation in a number of areas. Examples of this include gasoline swaps at their refineries, joint control of some product pipelines, as well as joint public relations and lobbying efforts through industry associations.

Product swaps at refineries are a direct result of the closure of refineries during the 1980s and early 1990s and the lack of refining representation of the major oil companies in all regions of the country. Basically, oil companies and regional refiners will arrange to receive product supply at the refineries of their rivals in return for a similar amount of product to be delivered to their competitor at their own refineries. For example, Ultramar may provide product to Petro-Canada at its St-Romuald refinery to service Petro-Canada's Quebec City stations. In return, Petro-Canada would provide a similar volume of product to Ultramar for its Montreal market at its Montreal refinery. Companies would add their formulated additives to the product before delivery to their own stations. Swap arrangements are advantageous to refineries—they keep major companies competitive in regions where they do not have refining capacity and may benefit consumers by minimizing transportation costs.

Major companies also co-operate in controlling product pipelines. In this instance, major companies are often

partners in the pipeline in return for guaranteed pipeline use. These arrangements can be at the expense of independents who may be unable to use the pipelines or have only a low priority on their use. For example, Shell and Petro-Canada effectively control the product pipeline from Montreal to Ottawa. Independents in the Ottawa market are then limited to buying from the majors or else trucking imported product in from Montreal.

Major oil companies as well as regional refiner-marketers recognize that they have many common interests, particularly when it comes to lobbying politicians and the Canadian public about their preoccupations. They have formed industry associations that put forward their concerns and produce public relations information for the Canadian public. An example of this is the Canadian Petroleum Products Institute (CPPI). Joint lobbying efforts are common in Canadian industry. Independent gasoline retailers have formed their own associations to publicize their concerns. Examples of this include the Independent Retail Gasoline Marketers Association (IRGMA) as well as the Association Québécoise des Indépendants du Pétrole (AQUIP).

The relationship between major oil companies, regional refiners and independent retailers is complex. There is intense competition among these segments of the gasoline industry and yet a dependency also exists. While independents are clearly rivals, they are also very important customers, buying most of their product from the major refineries or terminals. Major and regional refiner-marketers compete among themselves for the business of the independents, and traditionally the relationship has been business-like and generally co-operative.

While the rapport is still positive, several new factors now influence it. The closure of many refineries in the 1980s and early 1990s meant that much of the under-utilized refinery capacity in Canada dried up. This has meant that the independents are less able to negotiate prices now than they were 15 years ago. The publication of rack prices has also lessened the capacity of independents to play one supplier off against another for greater discounts. More aggressive pricing policies by the majors and regionals have also deprived many independents of the price differential that was a cornerstone of their business in the 1980s.

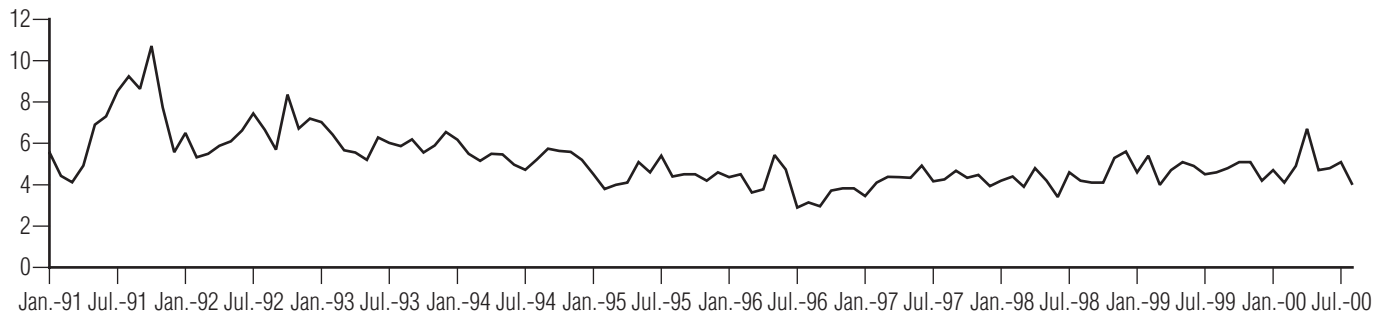
Retail Margins

Retail margins for the cities examined in this report have gradually declined since the early 1990s. After peaking at slightly over 10 c.p.l. in the early 1990s during the Persian Gulf War, margins have averaged about 4–5 c.p.l. in the latter part of the decade (see Chart 4). Margins are typically highest in the North, Quebec and Atlantic Canada and lowest in southern Ontario and Vancouver and somewhere between these two extremes in the Prairies and the rest of British Columbia. Margins differ from city to city and at different points in time, depending on local competitive conditions such as price wars and changes in per outlet sales volumes. Greater

street-level competition in the industry is the main factor behind the decline in retail margins.

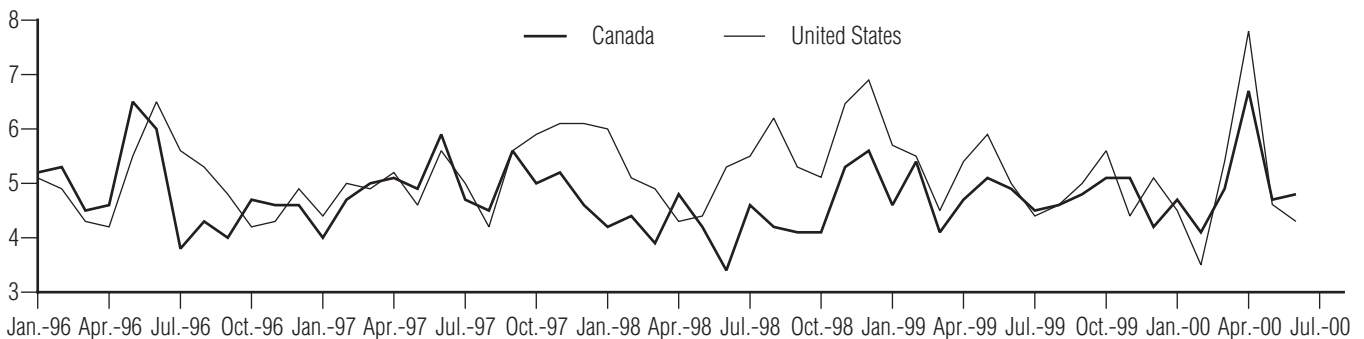
Chart 5 reveals that since the mid-1990s, retail margins in the United States have been slightly higher than Canada’s. Since 1996, U.S. retail margins have remained generally above 5 c.p.l. (all figures in Canadian dollars) and soared to almost 8 c.p.l. in the late winter of 1999 and early spring of 2000. With a few exceptions, Canadian retail margins tracked at just below the U.S. level. As was the case in the United States, margins rebounded in the early part of 2000 and briefly hit almost 7 c.p.l. in April before falling back. In August 2000, the average retail margin in Canada was 4.4 c.p.l.

Chart 4
Average Canadian Retail Margin
(cents per litre)



Source: M.J. Ervin.

Chart 5
Retail Margin Comparison: Canada vs. United States
(cents per litre, Canadian)



Note: The Canadian average retail margin is based on monthly Ervin data for 10 cities—St. John’s, Charlottetown, Halifax, Saint John, Montreal, Toronto, Winnipeg, Regina, Calgary and Vancouver. The U.S. average retail margin is based on monthly Ervin data for five cities located close to Canadian markets—Bangor, Maine; Plattsburgh, N.Y.; Buffalo, N.Y.; Minneapolis, Minnesota; and Seattle, Washington.

Source: M.J. Ervin.

compared with 6.6 c.p.l. in the United States. A possible explanation for the lower margins in Canada may be the different pricing market structure, as well as the greater prevalence of price wars.

Retail Gasoline Prices

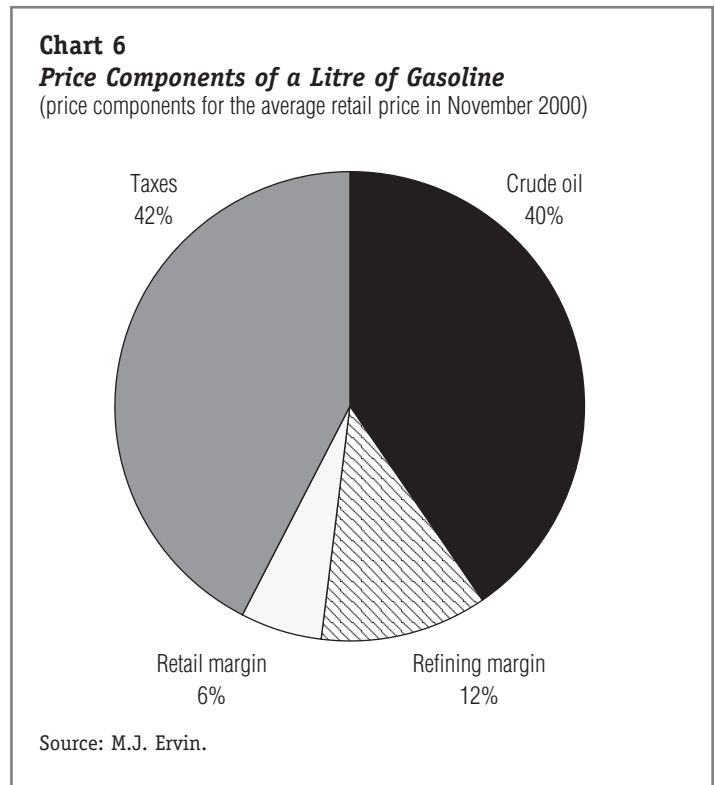
What Are the Major Components of Retail Gasoline Prices?

Retail gasoline prices consist of three major components: taxes, crude oil and a refining/marketing component. The components, including the refining and retail margin as of November 2000, are shown in Chart 6. In this document, all references to gasoline prices are for regular unleaded gasoline sold at a self-serve outlet. Chart 7 demonstrates how all price components are added up to give the final retail price that consumers see when filling up their cars.

Taxes and crude oil make up 84 per cent of the average pump price of a litre of gasoline. This leaves 16 per cent or just under 12 c.p.l. within the influence of the Canadian petroleum industry to cover refining, marketing and retailing fixed costs and operations. Only 6 per cent or just over 4 c.p.l. were within the influence of gasoline retailers.

Tax

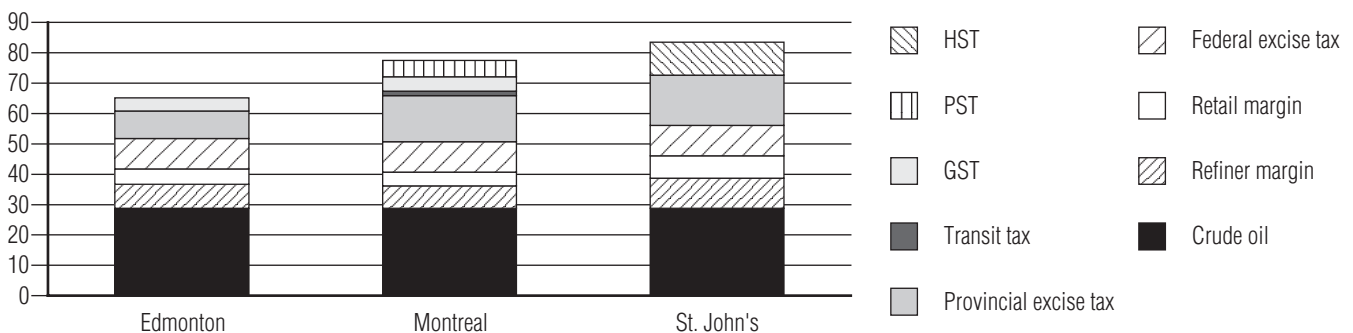
Taxes are the largest single element in the pump price of gasoline in Canada, making up about 42 per cent of the price on average. The taxes can be divided into three



components: federal excise tax, provincial consumption tax and the Goods and Services Tax (GST) as well as the Provincial Sales Taxes (PST) where applicable.

When fuel taxation was first introduced, its primary purpose was to finance the costs of building transport infrastructures. The federal government began supporting highway construction as early as 1919. With the implementation of the *Trans-Canada Highway Act* of 1949, the federal government confirmed its commitment to national infrastructure.

Chart 7
Price Components of the Retail Price of Gasoline for November 2000
(cents per litre)



Source: M.J. Ervin.

A 1996 study by Statistics Canada placed total fuel taxes at about 3 c.p.l. in 1957. The Ontario government had a 0.75 c.p.l. (3.0 cents per gallon) tax on gasoline as early as 1925.

Federal excise tax on fuel was introduced in 1975 at 1.5 c.p.l. The initial purpose of the excise tax was to lower demand for gasoline following the 1970s oil crisis. The federal excise tax increased to 3.5 c.p.l. in 1986; 5.5 c.p.l. in 1987; 6.5 c.p.l. in 1988 and 7.5 c.p.l. in 1989. In the early 1990s, the federal excise tax was raised to 8.5 c.p.l. and in 1995 reached its current level of 10.0 c.p.l. The federal excise tax is a flat tax and is imposed across Canada. This tax is added on to the other price components of gasoline (crude oil, refining margin and retail margin).

Provincial governments also charge a consumption tax on gasoline that varies from province to province. In 1971, the average provincial tax for the 10 provinces was 4.4 c.p.l., with Newfoundland the highest at 5.9 c.p.l. and British Columbia the lowest at 3.0 c.p.l. By 1999, that average provincial tax had increased to 12.9 c.p.l. Newfoundland remained the highest at 16.5 c.p.l., while Yukon has the lowest consumption tax at 6.2 c.p.l.

During the 1970s, the consumption tax in seven of the ten provinces remained at the same level, the major

exception being Alberta. From 1978 to 1988, the Government of Alberta eliminated the provincial consumption tax completely. At the same time, British Columbia and Newfoundland motorists saw a small increase.

During the 1980s and the early 1990s, the trend was towards increasing provincial consumption taxes on gasoline. Saskatchewan was the exception; it abolished the tax from 1983 to 1988. Since the mid-1990s, provincial consumption taxes have remained at the same level. Like the federal excise tax, the provincial consumption tax is a flat tax, but it varies among provinces (see Table 4). The provincial consumption tax is added on top of the other price components.

Since the introduction of the federal Goods and Services Tax in 1990, this value-added tax of 7 per cent has been added to the cost of gasoline. The GST was originally introduced to replace the manufacturing taxes that had previously been levied on gasoline. These taxes were as high as 12.0 per cent in 1971 and as low as 0.5 c.p.l. in 1973. The GST is levied on all components of the price of gasoline, including the federal excise tax and the provincial consumption tax. All Canadian provinces pay the GST, although for New Brunswick, Nova Scotia and Newfoundland, it is part of the Harmonized Sales Tax (HST) of 15.0 per cent. The HST is applied to the total cost of gasoline, including the federal excise and provincial consumption taxes. Quebec is the only province in Canada to explicitly charge a Provincial Sales Tax

Table 4
Applied Taxes on Gasoline in 2000

Provinces	Federal Excise Tax (c.p.l.)	Provincial Consumption Tax (c.p.l.)	GST (%)	PST (%)	HST (%)
British Columbia	10.0	11.0	7.0	0	0
Alberta	10.0	9.0	7.0	0	0
Saskatchewan	10.0	15.0	7.0	0	0
Manitoba	10.0	11.5	7.0	0	0
Ontario	10.0	14.7	7.0	0	0
Quebec	10.0	15.2	7.0	7.5	0
New Brunswick	10.0	10.7	0	0	15.0
Nova Scotia	10.0	13.5	0	0	15.0
Prince Edward Island	10.0	13.0	7.0	0	0
Newfoundland	10.0	16.5	0	0	15.0
Yukon	10.0	6.2	7.0	0	0
Northwest Territories	10.0	10.7	7.0	0	0

Source: M.J. Ervin.

of 7.5 per cent. The PST is also an ad-valorem tax and is calculated on the total cost of gasoline, which includes the ex-tax price of gasoline, the federal excise tax, the provincial consumption tax and the GST. Quebec reduces its provincial consumption tax by various amounts in certain remote areas and within 20 km of the provincial and the U.S. borders. Saskatchewan also reduces its provincial consumption taxes in Lloydminster because the city is located on the Saskatchewan–Alberta border.

Since an ad-valorem tax is a percentage of the total price, the revenue generated increases as the total cost of the product rises. For example, if the ex-tax price of gasoline increases by one cent per litre, the retail price will increase by 1.07 c.p.l. (1.0 c.p.l. + 7.0 per cent = 1.07 c.p.l.) in most provinces. Because of the explicit or implicit provincial sales taxes, the retail price will increase by 1.15 c.p.l. in Quebec, Nova Scotia, New Brunswick and Newfoundland.

Finally, some Canadian cities have their own transit taxes that are also a flat tax on retail gasoline. Vancouver, Victoria and Montreal have transit taxes in place of 4.0 c.p.l., 2.5 c.p.l. and 1.5 c.p.l. respectively. The GST and PST (for Montreal) is added on after the transit tax has been applied.

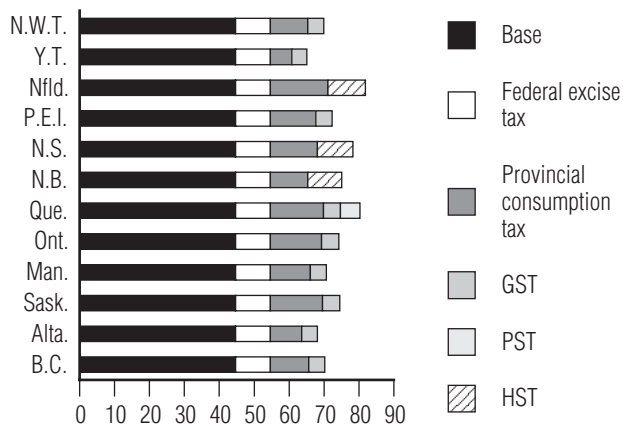
Differences in taxes between provinces explain much of the regional differences in pump prices. Assuming ex-tax prices were the same for every province (approximately 45.0 c.p.l.), Chart 8 shows how prices at the pump would vary across provinces and territories.

Native Indian retailers on reservations do not pay the GST in Canada or the HST in New Brunswick, Nova Scotia and Newfoundland. Neighbouring retailers without this exemption may find themselves at a disadvantage when competing with on-reservation retailers. For an 80.0 c.p.l. of gasoline, for example, removing the HST decreases the price by approximately 10.0 c.p.l. For provinces where only the GST applies, the difference is approximately 5.0 c.p.l. Retailers who are in competition with these outlets may need to lower their price, hence their retail margin, in order to stay competitive.

Chart 9 reveals that among industrialized nations Canada is actually on the lower end of the scale, in terms of gasoline taxes as a percentage of the retail price.

Chart 8
Comparison of Price Components of a Litre of Gasoline by Province and Territory

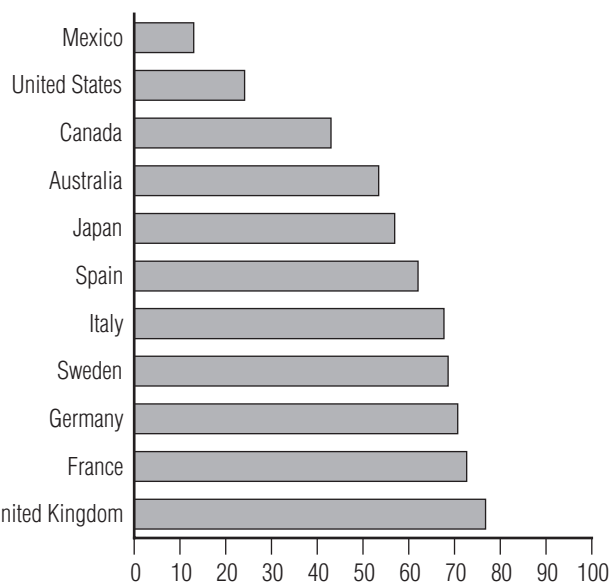
(cents per litre)



Source: M.J. Ervin.

Tax as a percentage figure only provides part of the story. In August, Canadians, on average, paid 30 cents in tax on each litre of gasoline purchased. Alternatively, a British motorist paid \$1.54 on each litre (assuming close to 77 per cent of a cost of \$2 per litre) or five times the amount of tax per litre paid by a Canadian motorist.

Chart 9
Gasoline Taxes as a Percentage of the Retail Price (1999)



Source: International Energy Agency.

The monies generated by fuel taxes represent an important source of revenue for the federal and provincial governments. For 1996–97, the revenue from the federal excise tax on gasoline was \$4.02 billion. This number has steadily risen as demand for gasoline continues to increase. The provinces also have benefited from the provincial consumption taxes. For 1996–97, the revenue generated by all provinces from the provincial consumption tax was \$5.64 billion. Ontario is the province that received the largest amount, approximately 44 per cent of the total amount (\$2.49 billion). The GST, HST and the Quebec sales tax cannot be estimated because all revenues from those taxes are aggregated.

When fuel consumption taxes were first introduced, they were to be used to offset costs related to the maintenance and construction of highway infrastructure. Today, they represent an important source of government revenue. According to the Canadian Automobile Association National Office, only about 4 per cent of the estimated \$5 billion in fuel taxes collected by the federal government is invested back into highway infrastructure.

Crude

Crude oil is the base product used to refine gasoline. It accounted for close to a third of the retail price of a litre of gasoline in 1999 before rising to over 40 per cent this year in line with the increase in crude oil prices. As mentioned earlier, the volatility in gasoline prices in the spring and summer of 2000 was mainly caused by the dramatic fluctuations in the

price of crude oil. World crude prices have almost tripled since 1998 and, given that the cost of crude makes up over 40 per cent of the pump price, it should not be surprising that pump prices have increased significantly in Canada.

Refining/Marketing

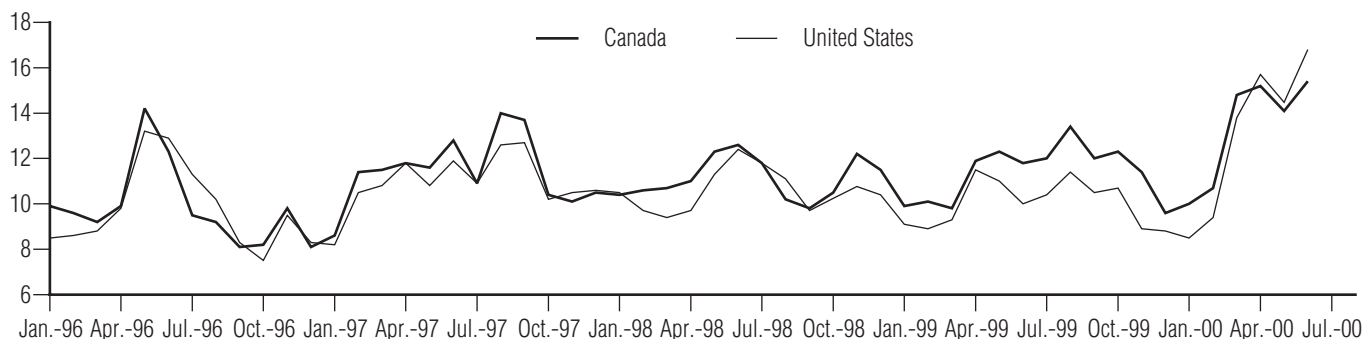
The refining and marketing portion constitutes the final component of retail gasoline prices. This portion of the price covers the cost of operations—such as the costs of refining the crude into gasoline, transportation and distribution charges, as well as the marketing and operational expenses at the retail level. This portion of the price should also account for a reasonable return on investment for both the refiner and the retailer.

This is the only component of the final retail gasoline price over which the gasoline industry has influence. In November 2000, when the average price for gasoline was 75.9 c.p.l., this portion accounted for 11.9 c.p.l., or 16 per cent of the pump price of gasoline. The refining margin was 7.7 c.p.l. and the marketing margin was 4.2 c.p.l. As Chart 10 shows, the total refining/marketing margins for Canada and the United States are similar.

How Are Prices Set?

On a broad scale, prices at the retail level are determined by factors such as crude oil and transportation. If one were to take an average retail price for unleaded gasoline for the entire country, the price would follow changes in

Chart 10
Total Margin Comparison: Canada vs. United States
(cents per litre, Canadian)

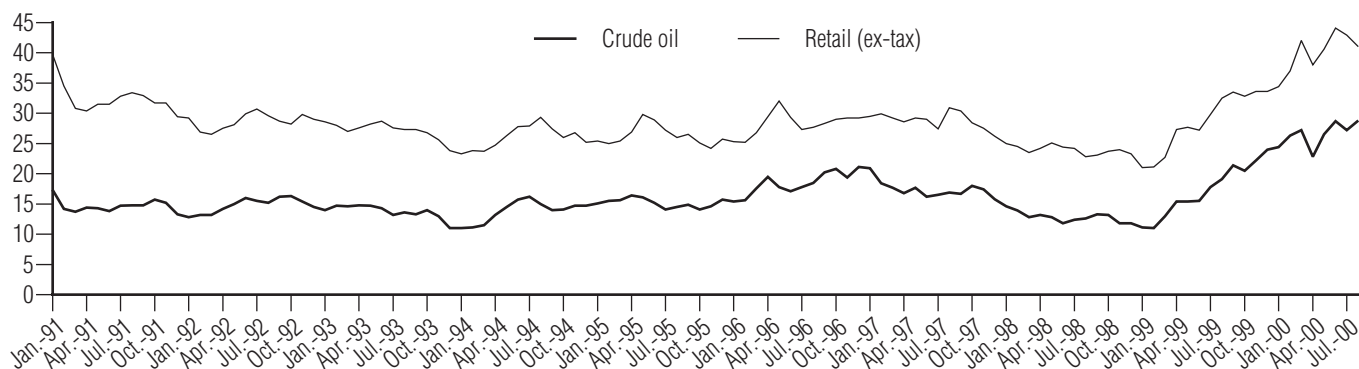


Sources: M.J. Ervin and U.S. Energy Information Administration.

Chart 11

Average Retail Price and Average Crude Oil Price in Canada

(cents per litre)



Sources: M.J. Ervin.

the world price of crude oil very closely (see Chart 11). However, national and even regional prices hide the complex process that determines prices at the street level across Canada. Each market has different dynamics, and this implies that prices are determined by local conditions that in some cases diverge from the rack price of gasoline. Also, the formulae and strategies for determining retail prices at the local level differ from region to region.

Another factor that makes the retail pricing of gasoline a very complex process has to do with the unique way in which prices are posted on large signs outside each outlet. No other commodity is subject to this much price awareness. The display of prices in this fashion means that both consumers and competitors are informed almost instantly of price changes within their region. Outlets must keep a careful eye on what the competition is doing because demand could decline significantly if their own prices are out of line with competitors within a wide radius. Prices can therefore change three to four times a day during periods of high price volatility.

Majors and Regionals

Most of the majors and regional refiner-marketers employ a set of tactics to ensure that each of their retail outlets remains competitive within their local markets. The following steps are generally taken before initiating a price change:

- Each outlet identifies the key competitors within a particular market (usually two or three) and then price

relationships are established with respect to these key competitors. The relationship depends on the characteristics of the key competitors. For instance, at a site where a full-service major is competing with a similar outlet, the pricing tactic would be to entirely match price reductions initiated by the competitor. If, however, a full-service major is competing with a branded

Exhibit 9 **Price Volatility and Uniformity**

Price volatility refers to the frequency of changing gasoline prices. Price uniformity refers to Canadian motorists' observations that posted gasoline prices within particular areas are identical or similar among all gasoline outlets.

Changing gasoline prices can be partly attributed to the frequent changes in the price of crude oil, which is the primary input in gasoline. While it takes up to a month for crude prices to be passed on to motorists, the frequent changes in world oil prices are a factor in fluctuating gasoline prices. The other important factor is the highly competitive nature of the gasoline industry at the street level.

Gasoline is the only commodity in our society for which the price is posted on large signs that can be read at 60 kilometres an hour. Both motorists and other service station operators become aware almost immediately of price changes among their competitors.

Canadian motorists are perceived as being very sensitive to gasoline prices, and this is borne out by their behaviour in the marketplace. Canadians will change stations for price differences of fractions of a penny, even though the impact of the price differences may only amount to five or ten cents on an average fill-up. Retailers, aware of this price consciousness among consumers, are concerned about losing sales and therefore reduce their prices almost immediately to match those of their competitors. This results in frequent price changes and accounts for the uniformity of gasoline prices within an area in which outlets are competing.

self-service or an unbranded independent, the tactic could differ in that the major full-service operator may permit the competitor to have a slightly lower price (0.2–0.3 c.p.l.). The differential between a major and an independent would account for brand value and the quality of the gasoline, as well as factors such as the availability of debit cards at the pump and ancillary products (e.g., convenience stores, car washes). In one-price markets, however, even a marginal difference may not be permitted within the pricing strategy.

- The pricing tactics are entered into a pricing system computer program at either a central or regional office.
- Dealers are responsible for monitoring the prices of the competitors and alerting the central office of any changes.

A price change will be approved using the predetermined site tactics at the location. This is contingent on the desired price change being within certain limits that take into account the:

- magnitude of the price change;
- number of competitors within the area that have requested a price change;
- number of price changes within a certain time period; and
- relationship between the price change and the posted rack price.

Independents

The independent operators use the same principles as the majors when making price changes, although the systems employed are generally not as technologically advanced. Smaller independents often do not have access to sophisticated price tracking systems. Depending on size and the number of stations within a region they control, the larger independents may have a number of representatives assigned to each region of their business. These individuals conduct daily surveys of the prices posted by the competition and authorize price changes based on margin calculations. Individual operators are generally permitted to make small price changes without authorization but must seek permission if enacting changes of more than 2–3 c.p.l. Smaller independents must monitor the competition on their own, sometimes on an hourly basis depending on the degree of volatility in a particular market.

Different Pricing Markets

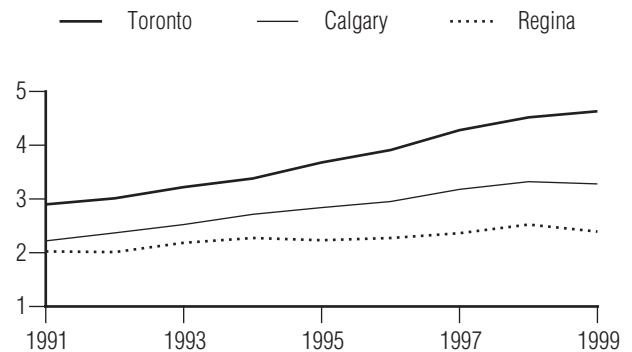
Multi-Price Markets

Most of the larger cities in Ontario have what is referred to as multi-price markets. Independents in these markets post slightly lower prices (0.2–0.3 c.p.l.) than the posted prices of the majors. The difference reflects the fact that the branded outlets may offer superior services, better locations and a well-recognized name compared with the independent outlet and can, therefore, post slightly higher prices without losing business. However, the differential is minimal, and if an independent attempted to post a price lower than the 0.3 c.p.l. difference, the majors would immediately match the posted price of the independent and wipe out the differential.

Multi-price markets are less prevalent outside of Ontario. This is likely due to the different levels of efficiency between the more heavily populated cities in Ontario and other parts of Canada. The larger population base in a city such as Toronto and the large average sales volume per outlet imply that these stations operate more efficiently than other less populated regions (see Chart 12). Efficiency in this case is measured as average sales volume or “throughput” per outlet.

The fact that most outlets in western Canada have lower throughputs compared with Ontario means that majors identically match prices posted by independents. They

Chart 12
Average Throughput per Outlet
(millions of litres)



Source: Kent Marketing.

simply cannot afford to allow their competition to have a lower price for fear of losing an important part of their relatively smaller sales volumes.

The United States, however, is a multi-price market that places greater emphasis on product differentiation. It is not unusual to have four outlets on a corner posting different prices for their products. One outlet might have a much lower price for regular unleaded gasoline, while another could have super gasoline posted at a less expensive price. Also, an outlet with a prime location can post a higher price than the competition without losing market share.

Single-Price Markets and Zone Pricing

Most Canadian markets outside Ontario are now single-price markets—the result of price wars and aggressive competition. This means that a single price will be charged within a market regardless of type of service, ancillary services, or whether a dealer is a major or an independent. Full-service stations charge the same price per litre as self-service. With split stations, i.e., those offering both full and self-service, a premium may be paid for service. An example of a single-price market is found in many Quebec markets. There, the dominant regional refiner/marketer, Ultramar, announced its ValuePlus program, whereby it promises to match any price within the relevant zone. This has rendered independents unable to differentiate themselves from competitors through lower prices. Differentiation may now take the form of discount coupons, rebates or giveaways. This type of pricing has become more common throughout Canada. Regional pricing characteristics are discussed later in the study when individual cities are considered.

A further variation on the single-price market is zone pricing—that is, single pricing among all retailers within a particular region. The size of the zone can vary by market—a large city may contain 50 zones, a smaller city and its outskirts may be considered a single zone. The size of the zone is determined by each company individually and is based on market composition and competitive conditions within the area.

Many independents believe that zone pricing, like single-price markets, is detrimental to their competitiveness as

it discourages the use of efficiencies to differentiate service by price. Any price reduction that a retailer can pass on to consumers to increase his/her market share will almost immediately be met with a similar price reduction by other dealers in the zone. Branded dealers, it is argued, can meet these prices because supports are available through their supply branches to ensure their competitiveness.

Within a zone, it is also asserted, branded dealers may attempt to increase their market share by aggressively reporting changes and attempting to maintain the lowest price possible. Under zone pricing, they are alleged to be able to maintain lower prices because their supplier would reduce their wholesale price, which effectively protects their margin. This would be detrimental to independent retailers, who may have no such support system and who would see their margin cut.

In theory, single-price markets and zone pricing benefit consumers by forcing all retailers to adopt the price of the most efficient operator. Reality, however, may be different. If a retailer is reluctant to lower prices to pass on savings to consumers as there is no sales advantage to doing so, prices will not be reduced to their lowest levels.

When a zone price is also extended beyond an urban area, the practice may pose a major disadvantage to unbranded independent dealers who may not enjoy the high throughput of urban competitors. While the lower margin may be sustainable based on high volumes, the rural dealer does not enjoy this situation. Again, branded dealers may enjoy some protection through their suppliers, but this would not extend to most independent retailers.

Price Increases

The decision to increase prices is monitored very closely by the majors and regional refiner-marketers. The attempt to raise prices will be initiated by one of these players rather than an independent. Within the industry, a price increase is described as a “price restoration.” This term implies that prices and retail margins are considered too low and that corrective action is required to bring margins to levels that are more acceptable to the industry. The following factors are considered before attempting to undertake a price increase:

- **Price differentials**—The differential between the average pump price and the rack price. The margin of this difference enables the operator to make a profit.
- **Customer perceptions**—If a major were viewed as always leading price increases in a market, customers may conclude that prices are higher at these locations. This could result in a long-term loss of business and customer loyalty.
- **The response of competitors**—An increase that is not matched by the competition will ultimately lead to a price rollback. Competitors may decide to leave their prices unchanged depending on the cost of their in-ground inventory. If, for instance, a dealer at an outlet has on hand a large inventory purchased at a very attractive rack price, the dealer could decide to not match the price initiated by the major in the hope of gaining market share. A successful price increase, therefore, depends on a thorough knowledge of the behaviour and likely reaction of competitors in the local market. The process is by nature very judgemental.

The independents do not lead a price restoration since they are generally price followers. Even some of the larger retailers in the country avoid initiating price increases because this would be at odds with their policy objectives or the way that they want to be perceived by the public. For instance, Ultramar's ValuePlus policy of matching the lowest pump price in the defined zone ensures that their outlets never initiate a price increase.

If retail margins are considered low in a market, the attempt to restore them to higher levels generally occurs once a week, although market conditions may sometimes

dictate that two weekly restorations may be justified. The timing of an increase is also critical. The majors or regionals will generally attempt to restore the price in a local market around noontime, usually in the early part or middle of the week when average sales are lowest. They will then wait to see how their competitors react. By 3:30 p.m., a decision must be made as to the success or failure of the increase. If the restoration is not working, the price must be reduced quickly to ensure that the posted price is not higher than that of the competition before the rush hour starts at 5:00 p.m.

What Happens During a Price War?

While consumers are concerned about many of the characteristics of retail gasoline pricing, one that they do not object to is the price wars that occur in different parts of the country from time to time. Price wars are a direct result of the intense competition that exists in the local area and the habit of posting prices on signs at each retail outlet. Wars develop when competitors continue to undercut each other and force the retail margin to be squeezed to the point where the reduced price is sometimes insufficient to cover operating costs. Major, regional or independent outlets can initiate price wars.

Price wars generally end when retail margins decline to the point where it is no longer economically viable for the majority of the competitors in the local market. An operator finally makes the difficult decision to be the first to raise prices and then hopes that the competition follows suit. Usually, competitors will match the increase as long as it leads back to a retail margin that is in line

Exhibit 10 ***Price Restorations***

Every week or two Canadians see gasoline prices change suddenly in their cities. These price increases are known in the industry as "price restorations" and they occur when retail margins fall below the levels that are felt necessary to provide a reasonable rate of return for service station operators.

The Canadian retail market is highly competitive and dealers are concerned about losing market share when their posted pump prices are higher than those of their competitors.

In order to minimize the risk of losing market share, a retailer will attempt to increase prices during a day of the week with low sales volumes, generally in early mid-week following the morning rush hour. The dealer will be authorized to raise his/her price and then monitor the competitors' reactions. If all competitors follow the price increase at their own stations, the increase will remain in place. If some dealers refuse to raise prices or raise prices by a lower amount, the price increase will be abandoned or adjusted generally before the evening rush hour.

Price restorations are almost always led by majors or regional refiners.

with the cost of doing business. Consumers frequently view the uniform increase in retail prices that occurs at the end of a price war as evidence of collusion. It is unlikely that this is the case since the uniform price increase generally reflects the fact that the participants involved in the price war must restore their margins or risk going out of business.

Sometimes attempts to regain a desired margin do not work and a protracted price war can continue for a relatively long period of time. This was the situation in Vancouver, which has experienced a price war since 1998. Up to the end of 1999, prices in this city were lower than they were in the mid-1990s and much lower than in most other Canadian markets. The price war was a direct result of increased competition from two new market entrants—an American regional refiner who operated within easy range of the lower mainland market, and a big box operator. Both reduced prices significantly in order to gain market share. Competitors were forced to match the lower prices in order to retain their customer base. The length of the price war forced some independents to leave the market and forced those remaining to exist on negative margins or restorations that have rarely brought the margin to 2 c.p.l. All retail participants in the lower mainland market likely have incurred financial losses. Refiner-marketers probably have had to subsidize the losses of their dealerships during this period.

An earlier series of price wars was undertaken in western Canada in the early 1990s. Major oil companies saw their market share eroded by independents all through the 1980s as majors had not responded to independents' lower prices. Faced with large retail losses due to lost market share, the majors aggressively fought to win back their customers by undercutting the independents' prices.

While price wars benefit motorists in the city affected by the disruption, consumers in other cities may pay the price. Anecdotal evidence was given that oil companies could increase prices in cities or regions with less competition to make up for the loss of revenue in the city affected by the price war. It is impossible, however, to prove this claim.

Price wars are likely to continue to be an ongoing characteristic of the gasoline industry. In fact, the proliferation

of convenience stores and other ancillary sources of income at retail outlets implies that the number and duration of price wars could actually increase. Revenue from a convenience store, for instance, means that operators can squeeze retail margins on gasoline even lower in the midst of a price war and still remain in business.

Empirical Analysis of Retail Prices

Some of the special characteristics of retail gasoline pricing were confirmed by the empirical analysis that was conducted on 11 cities across the country (see Appendix B). The most important component of the pump price is, not surprisingly, the wholesale price of gasoline in a particular city. However, an increase of one cent per litre in the wholesale price does not automatically lead to an identical increase in the retail price of gasoline. Local market conditions have an important impact.

The empirical analysis indicated that for any particular market over a given period of time, a market outcome margin exists that becomes the basis for pricing in that market. This market outcome margin is not an absolute figure—it simply reflects local competitive conditions at that time. If, for instance, a dealer is operating with a margin that is below that of the market outcome, a one-cent increase in wholesale prices could result in a retail price increase greater than one cent. In this situation, the dealer attempts to restore a margin that enables a more reasonable rate of return. Conversely, the wholesale price would not be completely reflected in the retail price if the dealer were operating with a margin above that of the market outcome.

Retail prices and margins differ from city to city across the country in large part because of different average sales volumes per outlet and taxes. Since most operating costs for a gasoline station are fixed, a dealer in a city with a high average throughput does not require as high a margin as a dealer in a city with relatively low average per outlet sales. In the latter case, the operator requires a higher margin to compensate for the fact that the outlet is selling a far lower volume.

The other factor that leads to different prices in different parts of the country is population density per outlet. In a

Exhibit 11 Market Outcome Margin

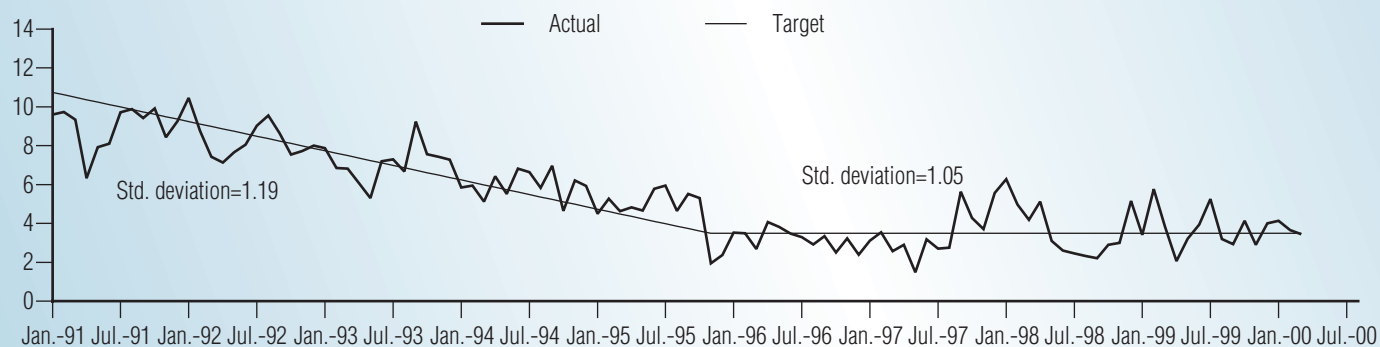
The market outcome margin is an analytical tool developed by The Conference Board of Canada. It helps us to understand why retail prices change and the variation in the magnitude of those changes. The market outcome margin reflects the local market conditions that gasoline retailers take into account when adjusting their price to a change in their cost of gasoline. This tool helps to explain why gasoline price increases are greater than the change in costs when retail margins are low, and lower when retail margins are high. The opposite is true for cost decreases.

The market outcome margin is NOT a result of collusion, but reflects the local street level competitive conditions in a certain market. The retail margin in a specific market tends to revolve around the market outcome margin. This margin is not always a sustainable equilibrium because it may reflect the occurrence of a price war. For example, a price war took place in Vancouver in 1999, during which the market outcome margin was approximately minus two cents per litre (-2.0 c.p.l.). This means that service stations were selling their gasoline below their actual cost. This is clearly not a situation in which retailers can remain in business.

The Conference Board of Canada calculated the market outcome margin by fitting a trend line through the observed margins in each city. Where structural breaks in the observed margins occur, a second trend is calculated.

The market outcome margin for Ottawa is shown in the chart. Starting in the early 1990s, the market outcome margin declined from approximately 10 c.p.l. to 4 c.p.l. Since 1996, it appears to be constant at about 4 c.p.l., although volatility remains around the market outcome margin. This volatility reflects the local competitive environment, as businesses try to capture market share from price-sensitive motorists.

According to our market outcome margin, if the actual margin is more than 4 c.p.l., a one-cent increase in costs would result in an increase at the pump of less than one cent due to street-level competition. If the competitive market in Ottawa were operating below 4 c.p.l., then the increase at the pump would be greater than one cent as retailers try to re-establish the market outcome margin.



city with a higher population density, consumers are likely to make more trips to outlets to purchase not only gasoline but other ancillary goods and services compared with cities with lower population densities. Consequently, cities with higher population densities per outlet should have lower retail margins and prices.

Not surprisingly, average income was not an important factor in explaining retail prices. This suggests that gasoline is a product that consumers purchase irrespective of income, in accordance with their requirements. In addition, the absolute number of retail outlets does not appear to affect pump prices if there is a minimum number of competitors in the market. In cities where only a few companies dominate the market, prices are not necessarily higher compared with cities that have many companies, including majors, regionals and

independents selling gasoline. This suggests that the retail gasoline market is one where a single player or new entrant can have a significant influence even if the market is highly concentrated. This was certainly the situation in Vancouver, where the dominant player in the market was forced to significantly reduce prices because a relatively small player entered the market and attempted to gain market share by starting a price war.

Stakeholder Concerns

Volatility

While consumers clearly benefit from the lower pump prices that result from a price war, they become annoyed and frustrated with the frequency and size of gasoline price changes. It is not unusual in some local markets to

see prices drop by 5–6 c.p.l. only to shoot up by the same amount on the following day. Chart 13 illustrates this phenomenon during the Vancouver price war, in which retail prices moved up and down by as much as 10 c.p.l. from day to day.

The habit of posting prices on signs outside each outlet promotes volatility. Competitors must react rapidly to price reductions in order to retain their customer base and market share. While volatility has always been a characteristic of the gasoline market, it has intensified throughout the 1990s, although for eight of the cities studied there was less volatility in the late part of the 1990s than in the earlier part. Some of the factors explaining the increase in price volatility include:

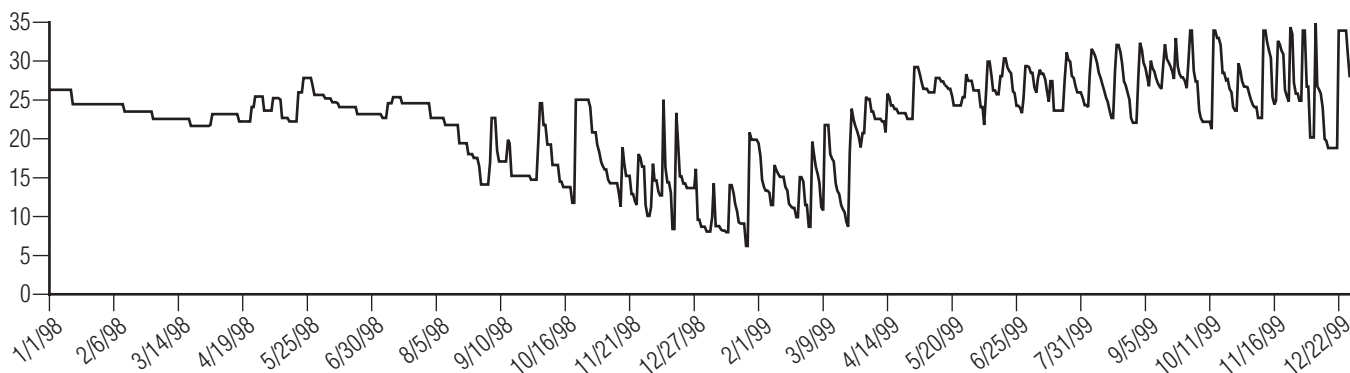
- **Crude oil price volatility**—In the past year, world crude oil markets have been far more volatile due to OPEC’s decision to cut back on production. Volatility in crude prices naturally affects the retail market, given that crude comprises over 40 per cent of the pump price of gasoline.
- **Technology**—Before the widespread use of computers, a company-owned outlet had to call the head office to get a price change approved by a manager. Without computers, this process could take a considerable amount of time in order to make the necessary calculations and approve the price change. In the 1990s, technological advancement enabled an operator to quickly obtain approval to implement a price change. As a result, it is possible for operators to initiate a

number of price changes in a single day depending on local market conditions. This naturally increases volatility.

- **Compensation by sales volume**—Increased volatility on weekends is sometimes the result of the relationships that some oil companies have with their operators. Some retailers are compensated according to the volume of gasoline sold at their outlets either through commission arrangements or through guaranteed margins. On weekends, when the head office of smaller companies may be closed and operators do not have to seek approval for a price change, there is an incentive to start a price war. In this situation, it would be difficult to determine who actually starts the war. Therefore, the operator has an incentive to “cheat” by lowering the price without approval from the head office since there is little chance of being caught, and the payoff in terms of higher throughput and more revenue could be significant.

Volatility will continue to be an important characteristic of retail gasoline pricing. Price volatility does not seem to be the result of collusion on the part of industry. It is an indication of a high degree of competition at the street level. As such, it reflects the unique environment within which the industry operates. Price volatility could be eliminated if other provinces were to follow the lead of Prince Edward Island and regulate the price of gasoline. However, the evidence does not indicate that consumers are better served by having a regulated market. Ex-tax retail prices in Prince Edward Island are not lower and for some extended periods of time have even been

Chart 13
Daily Retail Prices for Vancouver (Ex-tax)
(cents per litre)



Sources: IRGMA.

higher than in other parts of the country and the Canadian average (see Chart 14).

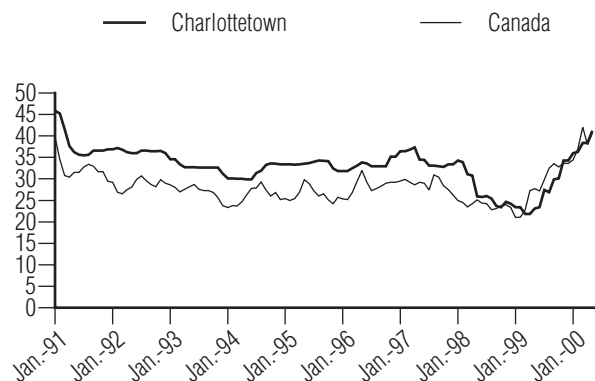
Cross-Subsidization

Some of the independents believe that they are at a competitive disadvantage vis-à-vis the major and regional refiner-marketers because the majors could use the upstream and refining portion of their operations to cross-subsidize their retail businesses. The contention is that present economic conditions enable the majors to earn large profits in their upstream business with world crude oil prices above the Can. \$44 (U.S. \$30) a barrel level. This provides them with internal funds to finance station upgrades. More importantly, independents contend that the majors then have the available revenue from the upstream business to squeeze margins at the retail level, increase the throughputs of their own stations and put independent operators at a serious disadvantage.

The majors contend that cross-subsidization does not occur in their business since the three portions of their business—exploration and production, refining and retailing—are all required to earn a positive rate of return and are given return targets in line with investor expectations. They also point out that most of the refineries purchase much of their crude oil at world prices from other Canadian or international sources. They argue that revenue does not flow from one part of the business to another during periods when a part of the overall business is in trouble. They also point out that in 1998 crude prices fell to almost Can. \$14 (U.S. \$10) a barrel and that the upstream part of the business did not perform up to expectations. Given the manner in which majors provide their financial reporting, it is impossible to confirm whether charges of cross-subsidization have merit.

The empirical analysis (see Appendix B) did not find significant evidence of cross-subsidization between upstream and retail margins or refining and retail margins. The results were consistent with cross-subsidization, but they were statistically insignificant or of a low order of magnitude. However, aggregate data could sometimes mask activities taking place at the local market level. Independent operators contend that during a price war, majors simply reduce the wholesale price temporarily to enable their dealers to earn a positive margin. Some of

Chart 14
Charlottetown and Average Canadian Retail Price (Ex-tax)
(cents per litre)



Source: M.J. Ervin.

the majors and regional refiners do provide price support for dealers involved in a protracted price war, although they contend that this is a relatively rare occurrence.

There is no doubt that using a price support mechanism would provide branded dealers with an advantage over many of the independents. Independents must purchase product from the terminal at posted rack prices or with minimal discounts and are, therefore, not in a position to provide financial relief for any of their dealers who are involved in a protracted price war. The price paid by dealers associated with refiner-marketers is less clear, as gasoline is often on consignment from the refiner or is directly owned by the refiner up to the point of sale and is thus not associated with a transparent rack price.

Exhibit 12 **Do Prices Increase Before Long Weekends?**

The empirical work revealed that gasoline prices do not necessarily increase prior to long weekends in the summer, as many Canadians perceive (see Appendix B). While it is true that prices do sometimes shoot up before long weekends, they are just as likely to increase prior to any other weekend throughout the year. The fact is that dealers attempt to increase prices in the middle of the week in order to earn a higher margin. If the restoration does not succeed, prices tend to drift down on Friday and the weekend. This could happen in any season, not just the summer. However, it is more likely to happen in the summer because demand is higher and inventories are lower compared with the winter months. Increases before long weekends may more likely be accepted by competitors in anticipation of the higher holiday demand, but this cannot be proven empirically.

Comparison of Canadian Centres

CHAPTER 2

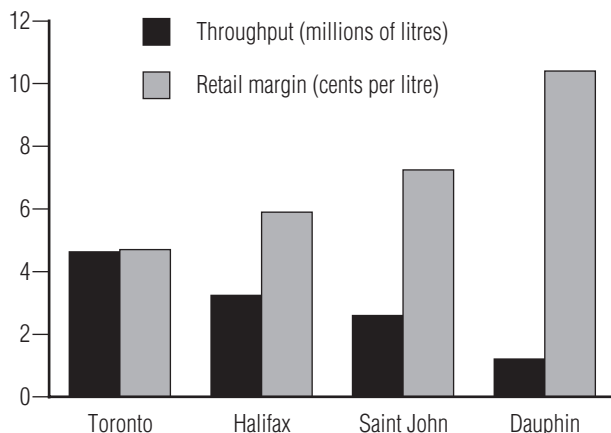
In this section we will look at the retail gasoline industry in 16 cities across Canada. Table 5 summarizes the market characteristics for each city.

A variety of factors create variations in retail prices in different regions. As seen earlier in Chart 8, taxation varies depending on the province or territory and can create a difference of as much as 16.7 c.p.l., all other factors (crude cost and margins) being equal.

Another important factor affecting price is throughput. If competitive conditions are the same, throughputs are a determining factor in what retail margin is charged within a given market. Chart 15 shows the relationship between average throughputs and average retail margins for four cities. As explained earlier, the relationship of throughput and price is clear. Any outlet has certain fixed costs that must be met regardless of the station's output. The higher the volume of sales, the lower the impact of these costs on retail margins. Higher population and a higher density of population per outlet generally lead to higher average throughputs.

Chart 15
Comparison of Various Cities by Throughput and Retail Margin

(millions of litres; cents per litre)



Sources: M.J. Ervin and Kent Marketing.

Table 5
Market Characteristics for 1999

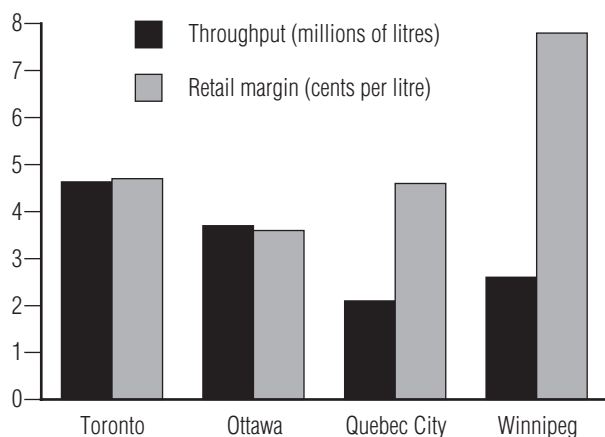
City	Outlets	Average volume (million litres)	Population	Density per station
St. John's	51	2.30	175,000	3,400
Charlottetown	21	2.00	33,520	1,600
Saint John	44	2.60	127,211	2,900
Halifax	94	3.24	352,594	3,750
Quebec City	296	2.10	688,025	2,324
Montreal	1021	2.60	1,810,619	1,722
Ottawa	179	3.70	809,034	4,519
Toronto (Metro)	449	4.63	2,500,000	5,620
Winnipeg	237	2.60	677,625	2,859
Regina	81	2.48	199,163	2,459
Calgary	298	3.28	933,748	3,133
Vancouver	350	3.92	2,016,643	5,762
Whitehorse	17	1.43	18,792	1,105
Sault Ste. Marie	23	3.07	79,899	3,474
Dauphin	12	1.21	11,128	927
Smithers	5	2.22	6,104	1,221

Sources: Kent Marketing, M.J. Ervin and Statistics Canada.

When analyzing city throughputs, where data were available, we have also looked at changes in throughputs among the key players in the retail market—majors, refiner-marketers and independents. We have compared both the number of stations as well as the throughputs for each category of retailer for 1991 and 1999 and commented on how these evolutions can be used to explain some of the pricing characteristics in each market.

The analysis of cities also looks at the density of population per outlet. Higher density suggests that more people would pass through a station on a given day. The greater the traffic in the station, the greater the chances of ancillary sales, i.e., sales of cigarettes, milk, services and other non-gasoline related revenues. Higher density, therefore, may increase the ability to sustain lower retail margins because stations would be less dependent on gasoline sales to meet fixed costs. Both throughput and station

Chart 16
Comparison of Various Cities by Throughput and Retail Margin
 (millions of litres; cents per litre)



Sources: M.J. Ervin and Kent Marketing.

density have been shown to be statistically significant in influencing retail margins in our empirical analysis (see Appendix B).

The competitive conditions in each market accentuate the differences between cities. Quebec City, for example, has low throughputs as well as low margins. These may be affected by a number of factors, such as the aggressive pricing activities of independents, regional competitive policies such as low price guarantees, zone pricing policies and the competitive history of the markets (e.g., sustained price wars). The availability of import options and proximity of competing markets may also bring about differences.

Chart 16 shows the volumes and margins for several cities where competitive conditions are a predominant factor in determining retail margins.

St. John's, Newfoundland

St. John's is the largest centre in Newfoundland and Labrador, with a population of 175,000 (1999 estimate). In 1999, it had 56 service stations, five of which closed during the year, for a density of about one station per 3,400 people. This compares with 70 stations in 1991, a reduction of 27 per cent. Newfoundland, including

Labrador, represents one of the smallest markets in Canada. In terms of gasoline sales, it makes up just 2 per cent of the national market.

Of the 51 remaining stations, 20 are majors (down from 23 in 1991) and 26 are regional refiners (down from 37). While there are only five independent outlets (down from 10), they account for an important 19 per cent of gasoline sales by volume.

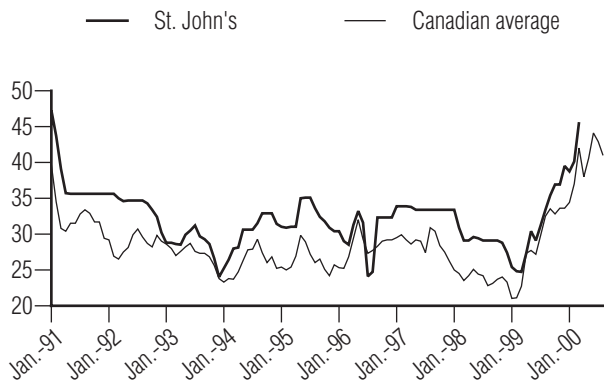
In 1999, the average sales volume per station for St. John's was 2.3 million litres per year, well below the Canadian average of 3.2 million and about 6 per cent lower than the Atlantic average of 2.41 million. This compares with a 1.8 million-litre average in 1991, an increase of 28 per cent. The average throughput for majors was just under 2.4 million litres (up from 2.1 million in 1991); for regional refiners it was 1.8 million (up from 1.6 million) and for independents it was almost 4.7 million litres (compared with 1.5 million in 1991). This is explained by the big box nature of three of the independent outlets and their high average throughput. The regional refiners' share of the market decreased from 48.5 per cent in 1991 to 41.7 per cent in 1999.

The majority of gasoline in St. John's comes from the Irving Refinery at Saint John, New Brunswick, the Imperial Refinery at Dartmouth, Nova Scotia, or from imported European product. Product is shipped to St. John's by bulk carriers and stored in terminals or bulk plants before being transported to the retailer by tankwagons. The North Atlantic refinery at Come By Chance limits its production to its own branded stations (none of which were located in St. John's in 1999) and to exports of reformulated gasoline (RFG) to U.S. markets.

The wholesale price of gasoline in St. John's has a high correlation to the New York harbour price and is not primarily influenced by the supply and demand characteristics of the St. John's wholesale market.

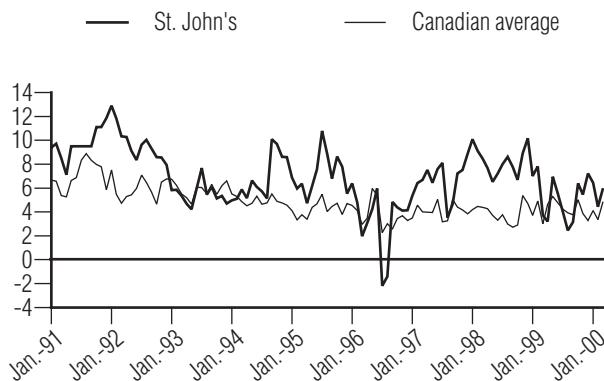
St. John's has some of the highest retail gasoline prices in Canada, which is partly due to a higher tax component. Taxes in St. John's represented over 43 per cent of

Chart 17
Retail Price for St. John's (Ex-tax)
 (cents per litre)



Source: M.J. Ervin and Kent Marketing.

Chart 18
Retail Margin for St. John's
 (cents per litre)



Source: M.J. Ervin.

the pump price (38 c.p.l.) in November 2000. For the four-week average to November 14, 2000, the ex-tax price in St. John's was 5.3 c.p.l. higher than the Canadian average and higher than prices in Saint John, New Brunswick, Charlottetown and Halifax. Higher prices in St. John's reflect the low volumes per outlet, the city's relative isolation from other competitive markets as well as high transportation costs.

Retail margins in St. John's are above average. While they decreased at the beginning of the 1990s as a result of industry rationalization and increased efficiency, they have averaged just over 6.0 c.p.l. for the period from

January 1993 to January 2000. St. John's has experienced several periods of low margins, particularly in mid-1996 and mid-1999, but generally does not benefit from price wars or aggressive pricing policies. Margins have hovered above the Canadian average. Again, this is consistent with low throughputs.

Charlottetown, Prince Edward Island

Charlottetown has an estimated population of 33,520 (1999 estimate). In 1999, it had 22 service stations, one of which closed during the year, for a density of about one station per 1,600 people. This represents a reduction in the number of stations of 19 per cent since 1988, when 26 outlets existed. This reduction took place entirely among stations owned by major refiner-marketers.

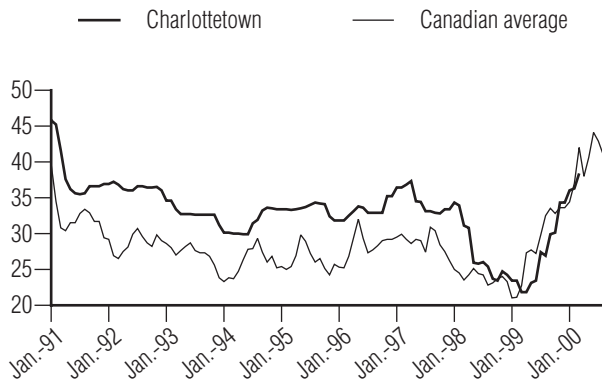
Of the 21 remaining stations, 9 are majors and 12 are regionals. There are no independent outlets in Charlottetown.

The average throughput for Charlottetown was 2.0 million litres per year for 1999, well below the Canadian average of 3.2 million and the Atlantic region's average of 2.41 million. In 1991, the average sales volume was 1.7 million litres. This low throughput reflects the low density of population per outlet. Compared to other Canadian centres, Charlottetown may be over-served with retail outlets. In 1999 the average throughput for majors was approximately 3.0 million litres (up from 1.8 million litres in 1991) and the regional refiners' was 1.4 million litres (down from 1.6 million and consistent with the lack of rationalization). Majors, through their rationalization and increased throughputs, have increased their market share (by volume) from 47.4 per cent in 1991 to 60.4 per cent in 1999.

Charlottetown has traditionally received its gasoline by marine tanker—usually from Halifax, but also from Saint John, Quebec City or Montreal.

Taxes in Prince Edward Island are somewhat lower than in other regions of the Maritimes. In November 2000, taxes constituted 28 c.p.l. or 37 per cent of the average retail price of 76.4 cents for a litre of gasoline. Nevertheless, prices in Charlottetown generally track higher than the national average.

Chart 19
Retail Price for Charlottetown (Ex-tax)
 (cents per litre)



Source: M.J. Ervin.

Prince Edward Island is currently the only jurisdiction in Canada in which gasoline prices are actively regulated. The Public Utilities Commission supervises all wholesalers and retailers with respect to the pricing of automotive and home heating oil. The Commission exercises its power to regulate the timing and frequency of price changes and determines the minimum and maximum mark-up between the wholesale price to the retailer and the retail price to the consumer. Applicants for price increases bear the burden of showing that a proposed price is fair and reasonable.

Although some competition remains in the P.E.I. market—for a minimum and maximum retail price can still be set—it appears that regulating gasoline prices has not resulted in lower prices for P.E.I. consumers. However, as crude oil and gasoline prices have increased rapidly since January 1999, P.E.I. increases have lagged behind those of other Atlantic provinces. Prince Edward Island has not benefited from price wars, which have resulted in periods of low prices in other provinces. At the same time, the low levels of throughput would not justify low margins (and as a result, low prices). Regulation has probably protected the viability of several Charlottetown outlets, but it has also kept prices higher and has not encouraged efficiency through rationalization. Nevertheless, P.E.I. motorists probably believe that they have greater control over gasoline prices and are protected against arbitrary increases.

While wholesale prices are available for Charlottetown, they are fixed by regulation. Marginal analysis therefore

has not been carried out, as it would not provide insight into market conditions.

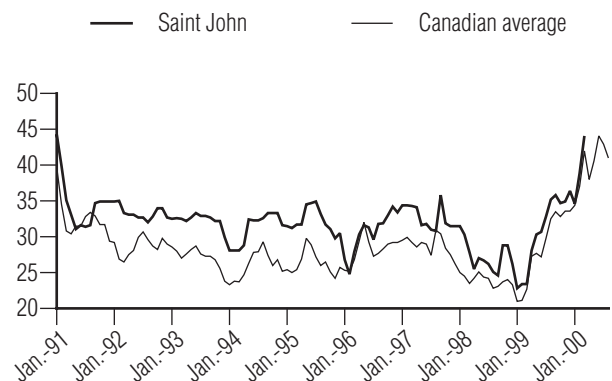
Saint John, New Brunswick

Saint John has a population of 127,211 (1999 estimate). In 1999, it had 47 service stations, three of which closed during the year, for a density of about one station per 2,900 people. This compares to 68 stations in 1990, a reduction of over 35 per cent.

Of the 44 remaining stations, 13 are major or are affiliated with their private brands (down from 21 in 1991) and 18 (down from 36) are regional refiners. There are 13 independent outlets (up from 9), which account for about 23.8 per cent of gasoline sales by volume, one of the highest volumes for independents in Canada. Irving, the regional refiner based in Saint John, controls almost 40 per cent of the market, the highest concentration for an individual brand within the centres being studied.

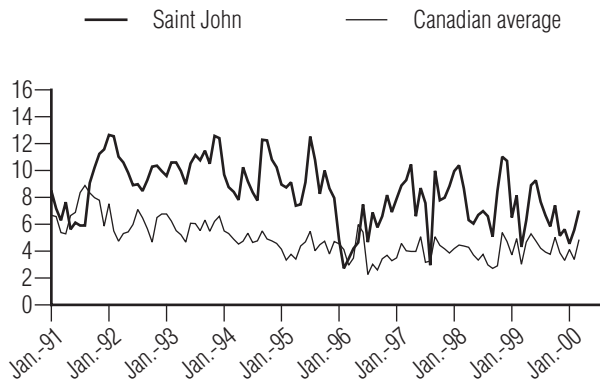
The average throughput for Saint John is 2.6 million litres per year in 1999, below the Canadian average of 3.2 million. This compares with a 1999 average for Saint John of 1.7 million litres. It should be noted that in 1999, the average throughput for majors was 2.8 million litres (up from 1.7 million); for regional refiners it was 2.6 million (up from 1.6 million) and for independents it was 2.1 million litres (up from 1.9 million).

Chart 20
Retail Price for Saint John (Ex-tax)
 (cents per litre)



Source: M.J. Ervin.

Chart 21
Retail Margin for Saint John
 (cents per litre)



Source: M.J. Ervin.

Tax in Saint John accounted for 31.2 c.p.l. (November 2000), or 39 per cent of the retail price for a litre of gasoline.

While much of Saint John's gasoline comes from the local refinery, the city is also a shipping and receiving point for marine shipments. Crude oil for the Saint John refinery arrives by sea.

Although a large refinery is located in Saint John, the city does not have the advantage of lower rack prices. Like all other centres in eastern and central Canada, the rack price is closely tied to continental wholesale prices reflected through the New York harbour price. The Irving refinery in Saint John does not post rack prices as it supplies its own stations exclusively.

Margins for Saint John are significantly higher than for Canada as a whole, averaging 9.5 c.p.l. from 1991 to late 1995 and hovering around the 7.25 c.p.l. mark since 1996. As a result, prices track above the national average.

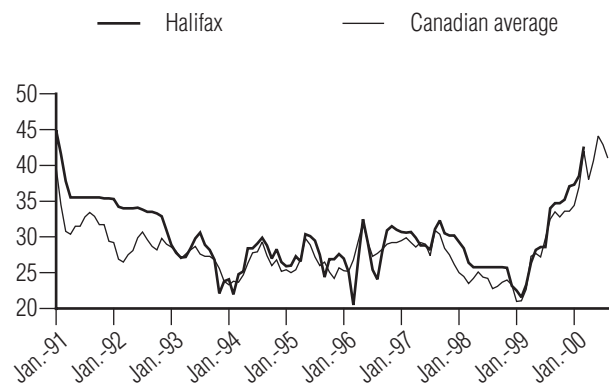
Halifax, Nova Scotia

Halifax has a population of 352,594 (1999 estimate). In 1999, it had 100 service stations, six of which closed during the year, for a density of about one station per 3,750 people. This compares to 138 stations in 1990, a reduction of almost 32 per cent.

Of the 94 remaining stations, 44 are majors or are affiliated with their private brands (down from 64 in 1991) and 42 are regional refiners (down from 67). There are 8 independent outlets (up from 5), which account for only 5.7 per cent of gasoline sales by volume.

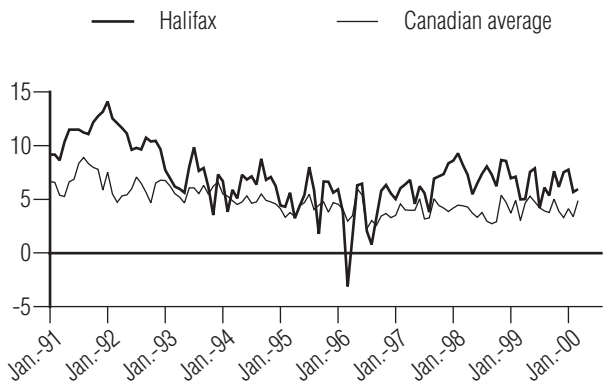
The average throughput for Halifax is 3.24 million litres per year for 1999, approximately the Canadian average and above the Atlantic region's average of 2.41 million litres. In 1991, the average sales volume was 2.05 million litres. The average throughput for majors in 1999 was 4.2 million litres (up from 2.5 million in 1991); for regional refiners it was 2.5 million (up from 1.7 million)

Chart 22
Retail Price for Halifax (Ex-tax)
 (cents per litre)



Source: M.J. Ervin.

Chart 23
Retail Margin for Halifax
 (cents per litre)



Source: M.J. Ervin.

and for independents it was 2.3 million litres (up from 1.5 million). Majors increased their average throughput by 68 per cent between 1991 and 1999, compared to 47 per cent for regional refiners and 53 per cent for independents.

Halifax obtains its gasoline from the local refinery. It also has a marine port, which gives the city the viable option of importing gasoline from either the U.S. East Coast or Europe.

As of November 2000, taxes made up 34.2 c.p.l., or nearly 42 per cent of the pump price of a litre of regular unleaded gasoline.

Prices in Halifax were regulated until mid-1991. Since that time, prices have closely followed the national average, with the exception of a price war in 1996, when prices fell below wholesale costs. Wholesale rack prices in Halifax are usually most closely tied to Boston prices, which in turn closely track those of New York harbour.

Margins in Halifax are above the Canadian average, but in line for a city with its throughput. Its margins are among the lowest in the Maritimes—the average margin between 1995 and 2000 was approximately 5.9 c.p.l. The relatively large throughputs of the major integrated gasoline companies may be a cause of these lower margins, for the majors are likely to be the price leaders, particularly given the relatively small role of the independents and their small average volumes (55 per cent of that of the majors). The high throughputs would be the direct result of the significant rationalization that has been going on in the market since 1990. Throughput for majors in the Maritimes jumped over 68 per cent from 1991 to 1999. It appears that the consumer in Halifax has benefited from the implicit increased efficiencies gained through the rationalization of the majors.

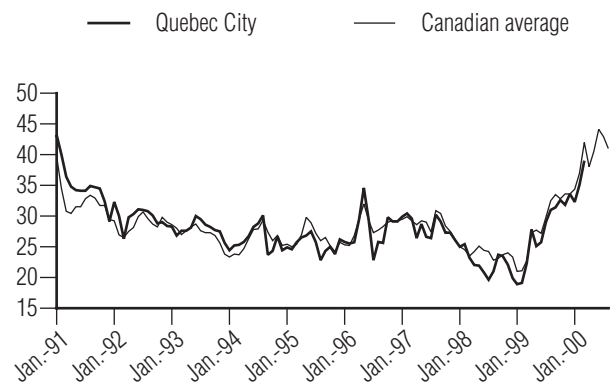
Quebec City, Quebec

Quebec City has a population of 688,025 (1999 estimate). In 1999, it had 303 service stations, seven of which closed during the year, for a density of about one station per 2,324 people. This represents a decrease of 23 per cent since 1992, when there were 385 outlets.

Of the 296 remaining stations, 103 are majors or are affiliated with their private brands (down from 188 in 1991) and 92 are regional refiners or are affiliated with their private brands (down from 104). There are 101 independent outlets (down from 106), which account for just under 23 per cent of gasoline sales by volume.

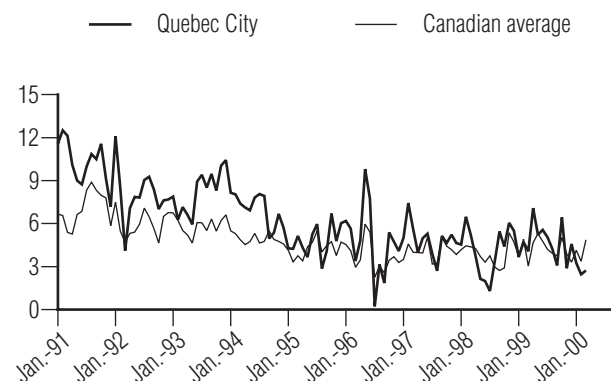
The average throughput for Quebec is 2.1 million litres per year, well below the Canadian average of 3.2 million. In 1991, the Quebec throughput was 1.4 million litres. It should be noted that the average throughput for majors was 2.6 million litres (up from 1.4 million in

Chart 24
Retail Price for Quebec City (Ex-tax)
(cents per litre)



Source: M.J. Ervin.

Chart 25
Retail Margin for Quebec City
(cents per litre)



Source: M.J. Ervin.

1991); for regional refiners and those affiliated with their brands it was 2.3 million (up from 1.5 million), and for independents it was 1.4 million litres (up from 1.2 million). Excluding big box operators, the average throughput for independents would be only 1.1 million litres.

As of November 2000, taxes on average accounted for 35.2 c.p.l., or over 46 per cent of the average retail price of gasoline.

Quebec City has a regional refinery in close proximity, which is the source of gasoline for many of the majors and independents. As a marine port, Quebec also has access to imported product.

Independents play an important role in the Quebec market, although their per station throughput (excluding big box operators) is just over 43 per cent of the volumes sold in a major refiner-marketer's typical station. Quebec's throughputs are relatively low and one would expect ex-tax prices in Quebec City to be somewhat higher than the Canadian average. Its prices, however, closely track the national average, although Quebec has benefited from price wars during several periods in the last 10 years. During the summer of 2000, Quebec City's prices were significantly lower than Montreal's prices, as consumers benefited from yet another price war and margins fell to approximately 2 c.p.l.

Due to the Ultramar ValuePlus program of matching the lowest price regardless of the level of service offered, Quebec tends to be a "one price" market, with independents, majors and regionals all showing similar prices.

Average margins in Quebec have been approximately 4.6 c.p.l. since 1995, although these margins can drop dramatically during a price war.

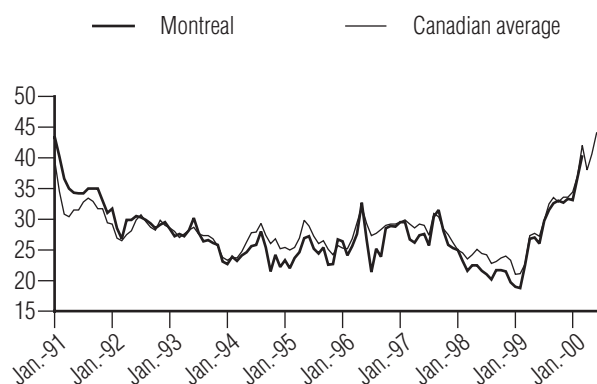
Montreal, Quebec

The City of Montreal has a population of 1,810,619 (1999 estimate). In 1999, it had 1,071 service stations, 50 of which closed during the year, for a density of about one station per 1,722 people. This compares to 1,419 outlets in 1991, a reduction of 32 per cent.

Of the 1,021 remaining stations, 420 are majors or are affiliated with their private brands (down from 701 in 1991) and 274 are regional refiners or are affiliated with their private brands (down from 327). There are 327 independent outlets (up from 142), which account for 15.3 per cent of gasoline sales by volume. Independents took over many of the outlets closed by the majors and regional-refiners.

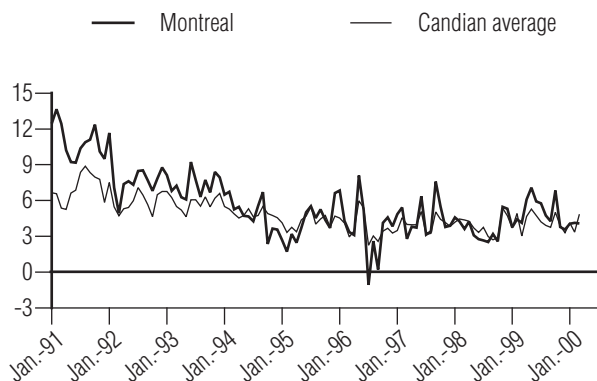
The average throughput for Montreal is 2.6 million litres per year for 1999, which is 19 per cent below the Canadian average of 3.2 million. In 1991, the average throughput was 1.7 million litres. The average

Chart 26
Retail Price for Montreal (Ex-tax)
(cents per litre)



Source: M.J. Ervin.

Chart 27
Retail Margin for Montreal
(cents per litre)



Source: M.J. Ervin.

throughput for majors was 3.6 million litres (up from 2.0 million in 1991); for regional refiners and those affiliated with their brands it was 2.6 million (up from 1.5), and for independents it was 1.23 million litres (down from 1.3 million). Excluding big box operators, the average throughput for independents is slightly less than one million litres per outlet annually for 1999.

Montreal has a local refining capacity and is relatively close to wholesale supply sources in the United States. It also has the marine capacity to receive shipments of international product. The wholesale market in Montreal is therefore highly competitive. Montreal has many independent outlets, although their market share is less important than their number. They make up 32 per cent of the outlets, but account for only 15.3 per cent of gasoline sales.

Montreal pump prices contain the highest tax component of any of the major centres. In November 2000, taxes made up 37.2 c.p.l. or approximately 46 per cent of the pump price. Ex-tax prices, however, track the national average very closely.

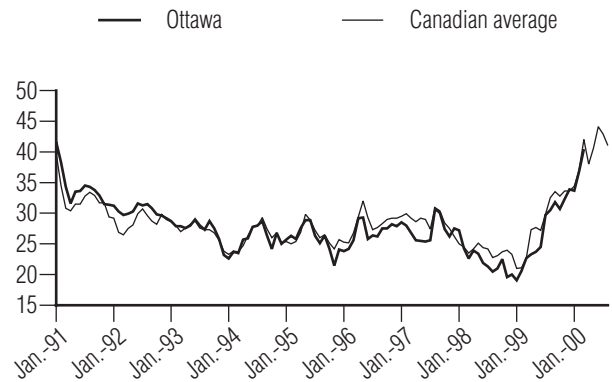
Despite the number of station closures since 1990, the density of population per station is extremely low in Montreal compared to other Canadian cities with populations over one million. Montreal's density per station is less than a third of that of Toronto or Vancouver. This is reflected in Montreal's comparatively much smaller average throughputs and higher prices.

The Montreal market has been volatile, closely matching wholesale prices. At the same time, Montreal has had fewer and less intensive incidents of price wars. However, on average Montreal has had only slightly higher margins than the norm for Canada as a whole at about 4.16 c.p.l. for the period since 1994.

Ottawa, Ontario

Ottawa has a population of 809,034 (1999 estimate). In 1999, it had 184 service stations, five of which closed during the year, for a density of about one station per 4,519 people. This represents a reduction of almost 27 per cent since 1991, when there were 244 stations.

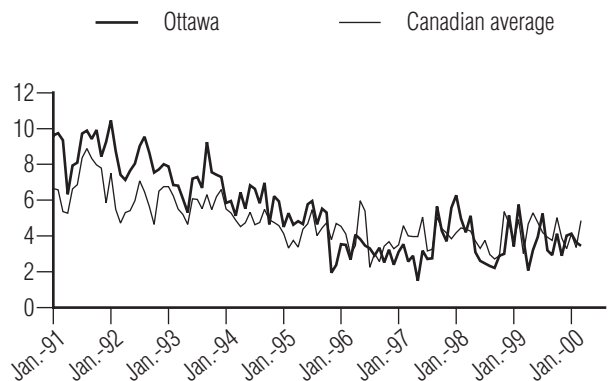
Chart 28
Retail Price for Ottawa (Ex-tax)
(cents per litre)



Source: M.J. Ervin.

Of the 179 remaining stations, 82 are major (down from 126 in 1991) and 21 are regional refiners (down from 27). There are 76 independent outlets (down from 91), which account for 26.2 per cent of gasoline sales by volume. Counted among these independents is Pioneer Petroleums, which accounts for 6.5 per cent of the market. Although 50 per cent of Pioneer has been acquired by Sunoco, a regional refiner, Pioneer's behaviour and pricing policies are more in line with those of an independent retailer. Excluding Pioneer, independents account for 19.7 per cent of the Ottawa market.

Chart 29
Retail Margin for Ottawa
(cents per litre)



Source: M.J. Ervin.

The average per outlet sales volume for Ottawa is 3.7 million litres per year for 1999. In 1991, the average was 2.1 million. The average throughput for majors was 5.1 million litres (it more than doubled from 2.5 million in 1991), regional refiners 3.8 million (up from 1.7) and independents 2.27 million litres (up from 1.7). Excluding big box operators and Pioneer, the average throughput for independents would only be 1.64 million litres (1.4 million in 1991).

Tax makes up 29.6 c.p.l. (November 2000), which accounts for 40 per cent of the average retail price of a litre of regular gasoline.

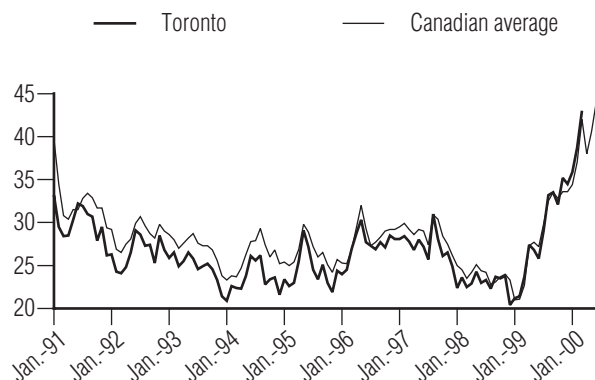
Gasoline refined by the majors generally comes into Ottawa by pipeline from Montreal. Supply conditions are therefore similar to those of that city. Independently imported product does not have access to the pipeline—it must be trucked in from Montreal or other points.

Retail margins in Ottawa are low relative to other centres of the same size. The market went through its rationalization period in the early 1990s, and since 1996 margins have averaged around 3.5 c.p.l. This is likely accounted for by the relatively high throughputs, particularly of the majors, as well as the presence of a large number of independents. The presence of strong independents has probably inspired a series of price wars, which has occasionally resulted in Ottawa prices and margins dropping below the national average.

Toronto, Ontario

Metro Toronto has a population of 2.5 million (1999 estimate), while 4,680,250 people live in the Greater Toronto Area. Toronto is by far the largest market in Canada. In 1999, Metro Toronto had 461 service stations, 12 of which closed during the year, thereby creating a density of about one station per 5,620 people, well above any other city in Canada. Since 1991, the number of stations has dropped by almost 34 per cent, for 695 stations operated in that year. The reduction in the number of the major refiner-marketers' stations was even more pronounced. Between 1991 and 1999, the majors reduced their outlets in Toronto from 475 to 263, a drop of almost 45 per cent. The reduced number of service stations caused by the rationalizations of the 1980s and 1990s is particularly apparent in Toronto because

Chart 30
Retail Price for Toronto (Ex-tax)
(cents per litre)

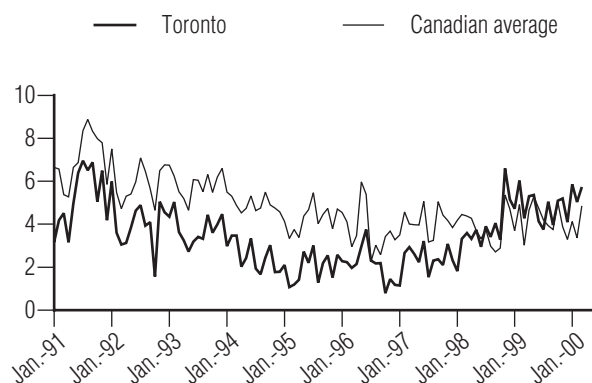


Source: M.J. Ervin.

of its high density. Of the 449 remaining stations in Toronto, 263 are majors or are affiliated with their private brands and 48 are regional refiners (down from 67 in 1991). There are 138 independent outlets (down from 153), which account for 17.2 per cent of gasoline sales by volume (21.5 per cent in 1991). If Pioneer were omitted from the group, the independents' share would fall to 15.6 per cent.

The average sales volume per station for Toronto is 4.63 million litres per year, which is 45 per cent above the Canadian average of 3.2 million. In 1991, the average throughput for Toronto was 2.9 million litres. The average throughput for majors and their private brands in 1999 was

Chart 31
Retail Margin for Toronto
(cents per litre)



Source: M.J. Ervin.

5.72 million litres (up from 2.9 million in 1991); for regional refiners it was 4.99 million litres (up from 3.0 million) and for independents it was 2.52 million litres (down from 2.8). Excluding big box operators and Pioneer, the average sales volume for independents in 1999 was 1.93 million litres (down from 2.3 million in 1991).

Taxes make up 29.5 c.p.l. of the average price of a litre of gasoline in Toronto (November 2000), or 40 per cent.

Refining takes place near Toronto—in fact, there is even a refinery in the Greater Toronto Area. The city is on the product pipeline from Sarnia and is close to U.S. wholesale markets. Thus, the import option is a key factor in the Toronto market, and wholesale rack prices closely reflect this potential competition.

Due to its high throughputs, Toronto is a much sought-after gasoline market. This has resulted in extended price wars and fierce competition within the market. Independents in particular have been hard-hit by this competition: they often do not have the financial resources that would allow them to sustain selling at the low retail margins that were typically found in Toronto during the 1994–98 period. During this period, margins averaged around 2.2 c.p.l.

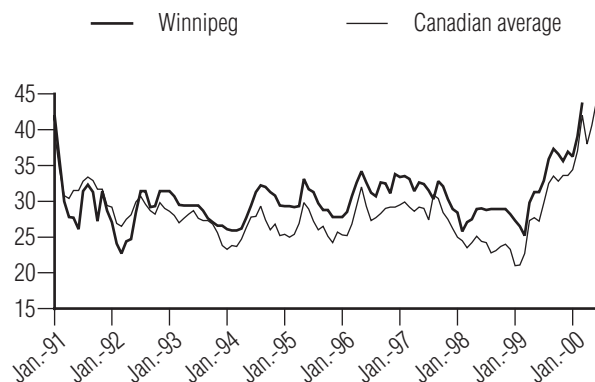
In spite of the price war, Toronto is one of the few multi-priced Canadian markets. Differentials between majors and independents are relatively small (usually no more than 0.3 c.p.l.), but they continue to exist.

Margins have risen significantly in Toronto over the past few months, possibly as a result of retailer fatigue over low margins and less aggressive price behaviour by independents. Since the end of 1998, average margins have recovered to over 5 c.p.l. How long Toronto will sustain relatively high margins is an issue for speculation.

Winnipeg, Manitoba

Winnipeg has a population of 677,625 (1999 estimate). In 1999, it had 243 service stations, six of which closed during the year, for a density of about one station per 2,859 people. The number of outlets has dropped by approximately 22 per cent since 1991, when there were 312 outlets.

Chart 32
Retail Price for Winnipeg (Ex-tax)
(cents per litre)

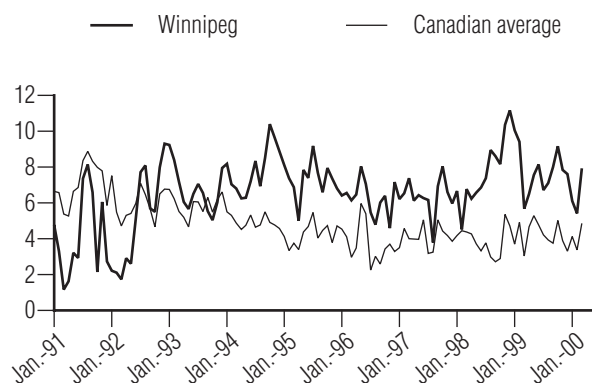


Source: M.J. Ervin.

Of the 237 remaining stations, 122 are majors or are affiliated with their private brands (down from 165 in 1991) and 65 are regional refiners or are affiliated with their private brands (up from 35 in 1991). There are 50 independent outlets (down from 112 in 1991), which account for 19.4 per cent of gasoline sales by volume (down from 33.1 per cent in 1991).

The average sales volume per outlet for Winnipeg for 1999 is 2.6 million litres per year, or 19 per cent below the Canadian average of 3.2 million. In 1991, the average was 1.9 million litres. The average throughput for majors and their brands was 2.73 million litres

Chart 33
Retail Margin for Winnipeg
(cents per litre)



Source: M.J. Ervin.

(up from 2.1 million in 1991); for regional refiners and their brands it was 2.4 million (up from 1.6 million in 1991) and for independents it was 2.43 million litres (up from 1.8 million in 1991). Excluding big box operators, the average throughput for independents is 2.07 million litres per outlet annually for 1999. While independent sales volumes in Winnipeg are below those of the majors, they nevertheless represent a significantly higher proportion of those of the majors than in other Canadian centres.

In November, tax made up 26.1 c.p.l. or 37 per cent of the Winnipeg pump price.

Winnipeg has no refining capacity in its immediate area, but is serviced by the product pipeline from Edmonton. Some import options exist, but they are limited.

Pricing in Winnipeg is relatively stable, although price wars benefited consumers in the early 1990s. Independents had gained significant market share from the majors during the 1980s. During the early 1990s, the major integrated companies took aggressive steps to gain it back, resulting in price wars.

The large presence of independents in Winnipeg does not seem to have lowered retail margins. Since 1994, margins have tended to be significantly higher in Winnipeg than the Canadian average at over 7 c.p.l. A possible explanation may be the relatively low throughputs, particularly among majors. In August 2000, Winnipeg again experienced a price war, with margins of barely 0.5 c.p.l. bringing about some of the lowest prices among all the major Canadian cities.

Like many prairie cities, Winnipeg has evolved into a one-price city, with no differential granted between independents and majors or between full- and self-service.

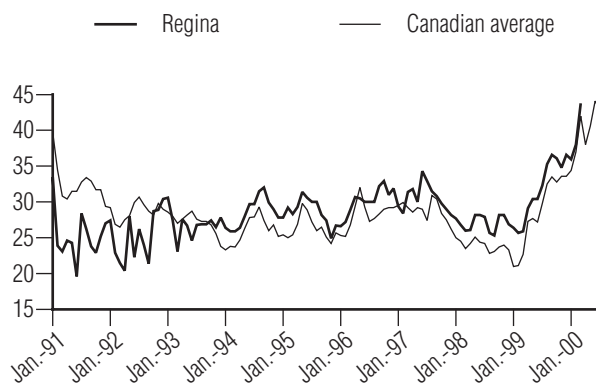
Regina, Saskatchewan

Regina has a population of 199,163 (1999 estimate). In 1999, it had 84 service stations, three of which closed during the year, for a density of about one station per 2,459 people. In 1991 there were 106—the number has dropped by nearly 24 per cent.

Of the 81 remaining stations, 48 are majors or are affiliated with their private brands (down from 59 in 1991) and 22 are regional refiners or are affiliated with their private brands (the same number as in 1991). There are 11 independent outlets (down from 25), which account for at least 6 per cent of gasoline sales by volume (three outlets did not report volumes).

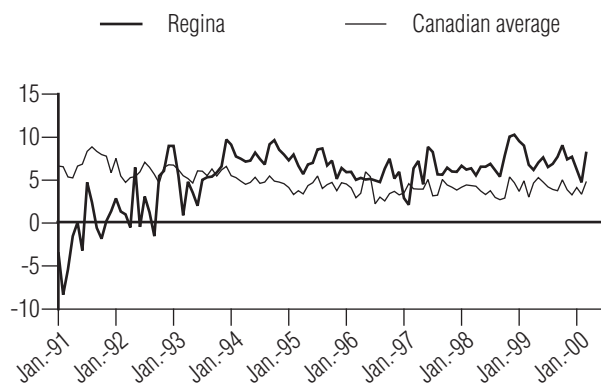
The average sales volume per outlet for Regina is 2.48 million litres per year for 1999, below the Canadian average of 3.2 million and slightly below the Prairies' average of 2.85 million. The average sales volume in 1991

Chart 34
Retail Price for Regina (Ex-tax)
(cents per litre)



Source: M.J. Ervin.

Chart 35
Retail Margin for Regina
(cents per litre)



Source: M.J. Ervin.

was 2.0 million litres. The average throughput for majors and their brands was 3.02 million litres (up from 2.1 million in 1991); for regional refiners and their brands it was 1.69 million (down from 2.5 million in 1991), and for independents it was 1.51 million litres (approximately the same level as in 1991). The majors' market share of volume increased from 57.2 per cent in 1991 to 73.7 per cent in 1999 due to the majors' rationalization and the failure of regionals and independents to increase throughput.

In November 2000, taxes made up 29.9 c.p.l., or 40 per cent of the retail price of a litre of regular unleaded gasoline.

Regina possesses its own refining capacity and also receives product through the Edmonton product pipeline.

Other than during a price war in the early 1990s, ex-tax prices in Regina have been higher than the Canadian average. Since 1994, the average retail margin has been 6.9 c.p.l. Regina's margins and throughputs tend to be consistent with a market of this size. Pump prices also tend to be higher than those in other prairie centres due to higher taxes in Saskatchewan. However, the pump price was as much as 10 c.p.l. higher than other prairie cities in August 2000, reflecting the higher margins as well as the fact that Winnipeg's prices were lower due to price wars.

Regina, like many other markets on the Prairies, is a one-price market with no differential by the level of service offered.

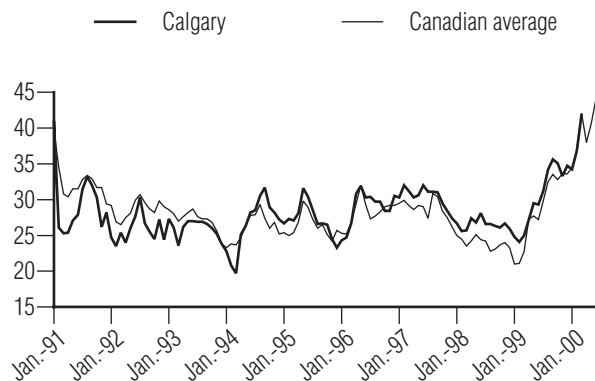
Calgary, Alberta

Calgary has a population of 933,748 (1999 estimate). In 1999, it had 304 service stations, six of which closed during the year, for a density of about one station per 3,133 people. The number of stations has decreased from 361 in 1991, by about 17.5 per cent.

Of the 298 remaining stations, 165 are majors or are affiliated with their private brands (down from 201 in 1991) and 73 are regional refiners or are affiliated with their private brands (up from 67). There are 60 independent outlets (down from 93), which account for 9.9 per cent of gasoline sales by volume.

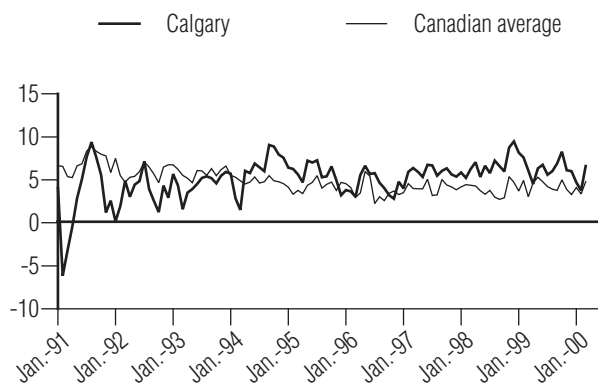
The average sales volume per outlet for Calgary is 3.28 million litres per year for 1999, which is approximately the Canadian average. In 1991, the average sales volume was 2.2 million litres. The 1999 average throughput for majors and their brands was 3.92 million litres (up from 2.2 million litres in 1991); for regional refiners and their brands it was 3.12 million (up from 3.0 million) and for independents it was 1.65 million litres (up from 1.60 million). Excluding big box operators, the average throughput for independents was 1.26 million litres per outlet annually for 1999. Majors, through their rationalization and increased throughputs, have increased

Chart 36
Retail Price for Calgary (Ex-tax)
(cents per litre)



Source: M.J. Ervin.

Chart 37
Retail Margin for Calgary
(cents per litre)



Source: M.J. Ervin.

their market share (by volume) from 55.6 per cent in 1991 to 66.6 per cent in 1999.

Calgary prices are traditionally among the lowest in Canada. This is in part because gasoline taxes in Alberta are the lowest among the 10 provinces. In November 2000, taxes made up just 23.4 c.p.l., or just under 34 per cent of the pump price. Ex-tax prices, however, are very close to the Canadian average.

After the market adjusted following the price wars of the early 1990s, margins in Calgary stabilized at an average of 6 c.p.l., slightly above the Canadian average. Like the other prairie markets, Calgary prices show little or no differential between branded and unbranded stations or between full-service and self-service stations.

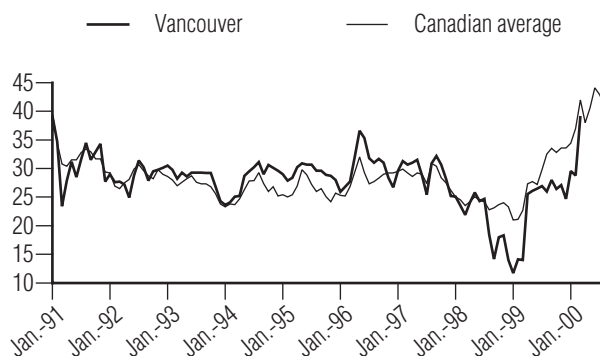
Vancouver, British Columbia

Vancouver has a population of 2,016,643 (1999 estimate). In 1999, it had 394 service stations, 44 of which closed during the year, for a density of about one station per 5,762 people. In comparison, there were 483 stations in 1995, so the number has dropped by 28 per cent. The number of stations continues to decline in Vancouver, particularly as a result of a severe price war that occurred in 1998–99.

Of the 350 remaining stations, 175 are owned by majors or are affiliated with their private brands (down from 286 in 1991) and 154 are regional refiners or are affiliated with their private brands (up from 115). There are 21 independent outlets, which account for at least 1.9 per cent of gasoline sales by volume. This represents a sharp reduction from 1991, when 96 independents were operating. The market share figure is probably higher, as five big box operators have not reported their volumes.

The average sales volume per outlet for Vancouver is 3.92 million litres per year for 1999, above both the Canadian and B.C. averages. In 1991, the average sales volume was 2.4 million litres. The average throughput for majors and their private brands was 4.02 million litres (up from 2.4 million in 1991); for regional refiners and their brands it was 4.16 million litres (up from 2.8 million), and for independents it was 1.28 million litres (down from 1.65

Chart 38
Retail Price for Vancouver (Ex-tax)
(cents per litre)



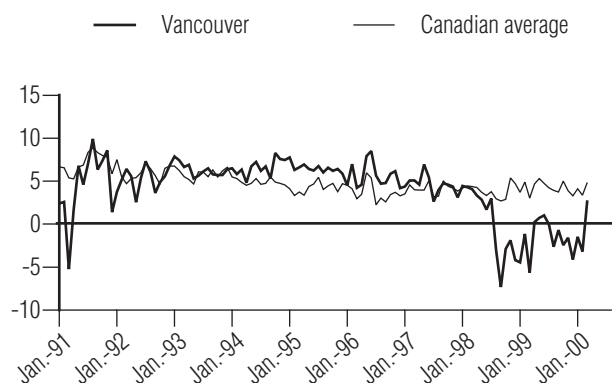
Source: M.J. Ervin.

million). The dominant player in the market is Chevron, a regional refiner, which has approximately one-third of the market share and an average throughput at its outlets that is more than 50 per cent higher than the Vancouver average.

In August 2000, taxes made up 40 per cent of the Vancouver pump price, or 29.9 c.p.l.

From 1993 to 1998, Vancouver stations earned an average retail margin of over 6 c.p.l. Consumers in Vancouver benefited from an extended price war in 1998–99, during which prices frequently dived well below cost. The average margin during this period was minus 2.1 c.p.l. The war was initiated by the two new entrants into the market—an American

Chart 39
Retail Margin for Vancouver
(cents per litre)



Source: M.J. Ervin.

regional refiner with a refining capacity just across the border from Vancouver and a big box operator. (Details of the price war are explored in an earlier section of the paper.) The price war was probably responsible for the closure of several stations and the withdrawal of some independent operators from the Vancouver market.

Vancouver prices have started to recover. Prices are falling more in line with the Canadian average and retail margins are returning to positive levels. However, retail margins are still smaller than those in other centres in British Columbia. But this is consistent with the larger throughputs found in Vancouver, particularly among the dominant players. Price increases have also become more frequent in Vancouver.

Smaller Centres

Part of the mandate of the study was to look at cities that have not been studied in earlier reports and that represent Canada's northern component as well as its rural regions. To this end, four additional cities were examined—Whitehorse, Yukon; Sault Ste. Marie, Ontario; Dauphin, Manitoba; and Smithers, British Columbia.

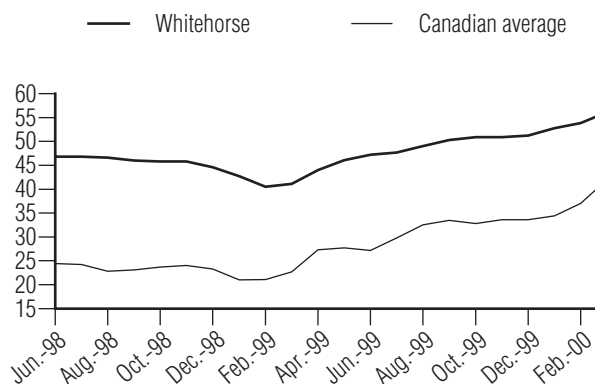
The study of these centres is limited by the amount of data and the relatively short time-series available. To facilitate analysis, the three rural centres are compared to the closest of the larger urban centres considered in this study. All four centres experience higher prices and larger margins than the bigger centres to the south. This is consistent with their low volumes and high freight costs.

Whitehorse, Yukon

Whitehorse has a population of 18,792 (1999 estimate) and is the largest city in the Yukon. Government is the major economic activity in Whitehorse—it occupies nearly a quarter of the labour force. In 1999, Whitehorse had 19 service stations, two of which closed during the year, thereby creating a density of about one station per 1,105 people.

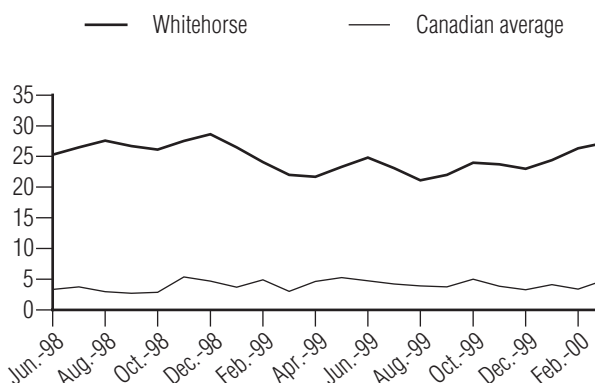
Of the 17 remaining stations, 10 are major and 5 are regional refiners or their private brands. There are two independent outlets, which account for 6.8 per cent of gasoline sales by volume.

Chart 40
Retail Price for Whitehorse (Ex-tax)
(cents per litre)



Source: M.J. Ervin.

Chart 41
Retail Margin for Whitehorse
(cents per litre)



Source: M.J. Ervin.

Yukon has the lowest gasoline taxes of any jurisdiction in Canada.

As noted, the analysis of the Whitehorse market is limited by the shortage of data as well as the relatively brief time-period over which it is available. Average sales volumes per outlet for Whitehorse are estimates, as volumes are available only for the last 181 days of 1999. The estimated average throughput is 1.43 million litres per year. The average throughput for majors is 1.7 million litres; for regional refiners and their private brands it is 1.01 million, and for independents it is 0.93 million litres.

There are four routes for bringing gasoline to Whitehorse. Most of Whitehorse's gasoline is shipped from Vancouver to Skagway, Alaska, and then trucked down. Smaller quantities of gasoline come from Fairbanks, Alaska, by road, via sea to Haines, and are then trucked up the Alaska Highway. Despite the low taxes, ex-tax prices in Whitehorse are among the highest in Canada. This is caused by average retail margins that are six times the Canadian average. Average retail margins (calculated on Vancouver rack prices) for the July 1998 to March 2000 period were 24.8 c.p.l. This is due to the relative isolation of Whitehorse and its distance from alternative sources of supply, high freight costs and very low throughputs, as well as to its limited number of stations.

Freight costs are approximately 10.0 c.p.l., almost 10 times those in a southern city. In addition, the low average throughputs also indicate that ancillary revenues, such as convenience store sales, are limited. Operators would therefore be more dependent on gasoline sales to meet their fixed costs.

The situation in Whitehorse is typical of that of other northern communities. They, too, suffer from high prices. Stations in Whitehorse and other territorial communities require exceedingly high margins in order to survive and absorb their high transportation costs relative to their low sales volumes.

Sault Ste. Marie, Ontario

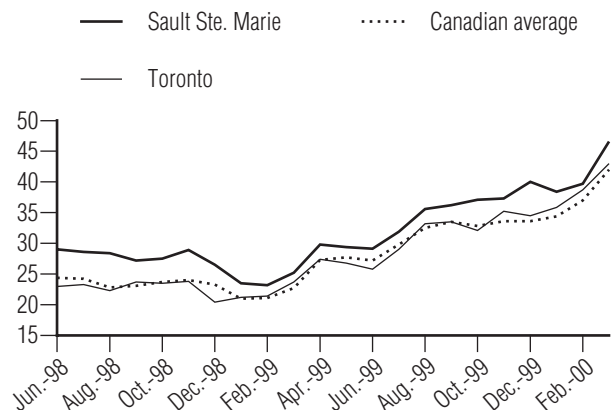
Sault Ste. Marie has a population of 79,899 (1999 estimate). In 1999, it had 23 service stations, for a density of about one station per 3,474 people.

Of the 23 stations, 14 are majors or are affiliated with their private brands and 3 are regional refiners. There are six independent outlets, which account for 18.9 per cent of gasoline sales by volume.

Average throughput for Sault Ste. Marie was 3.07 million litres per year in 1999. The average throughput for majors and their private brands was 3.78 million litres; for regional refiners it was 1.47 million, and for independents it was 2.22 million litres. However, if big box operators are removed from the independents, their average throughput falls to 1.28 million litres per year.

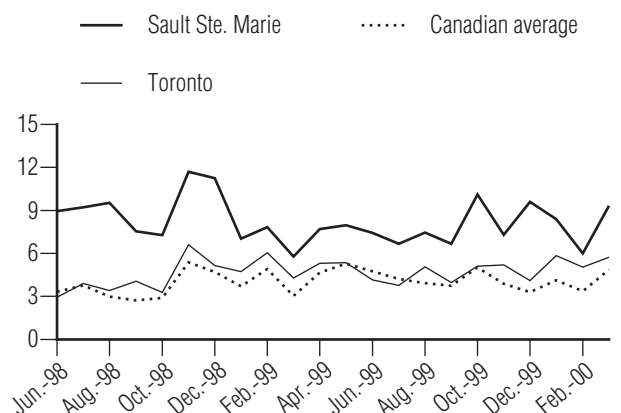
Toronto is the source of most of Sault Ste. Marie's gasoline. Sault Ste. Marie's prices closely track those of Toronto, albeit at a higher level. This is likely due to additional freight costs and lower average sales volumes. These factors probably are also responsible for the high retail margin in Sault Ste. Marie. In the 1998–2000 period, retail margins hovered around the 7.7 c.p.l. level. While this is a higher margin than those of most major cities, it is consistent with a city of Sault Ste. Marie's size and sales volumes as well as its additional freight costs. Margins are lower than those of the smaller centres that were also examined.

Chart 42
Retail Price for Sault Ste. Marie (Ex-tax)
(cents per litre)



Source: M.J. Ervin.

Chart 43
Retail Margin for Sault Ste. Marie
(cents per litre)



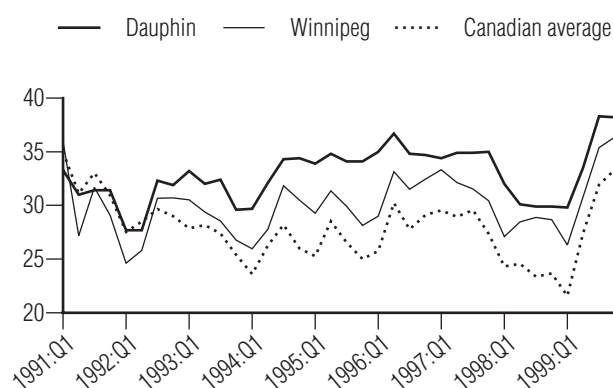
Source: M.J. Ervin.

For a centre of Sault Ste. Marie's size and population density per station, average sales volumes seem slightly lower than expected. This is probably because of Sault Ste. Marie's proximity to the U.S. border and the retail competition offered by that market.

Dauphin, Manitoba

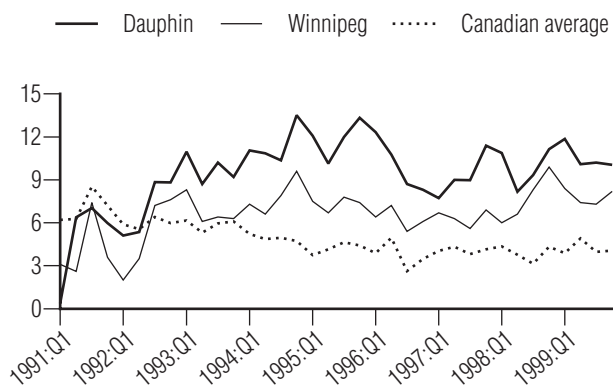
Dauphin has a population of approximately 11,128. It is the largest city in the northwest region of Manitoba and has a mixed manufacturing base. It is roughly equidistant from Winnipeg and Regina (325 km). In 1999, it had 12 service stations, for a density of about one station per 927 people.

Chart 44
Retail Price for Dauphin (Ex-tax)
(cents per litre)



Source: Kent Marketing and M.J. Ervin.

Chart 45
Retail Margin for Dauphin
(cents per litre)



Source: Kent Marketing and M.J. Ervin.

Of the 12 stations, 8 are major and 3 are regional refiners or are affiliated with their private brands. There is one independent outlet, which opened in the fourth quarter of 1999. As a result, there are not yet data on its volumes or market share.

The estimated average throughput for Dauphin was 1.21 million litres per year for 1999. The average throughput for majors was 1.13 million litres, and for regional refiners and their brands it was 1.43 million litres.

Dauphin's gasoline is trucked in from Winnipeg.

Dauphin has a large number of stations for such a small population, and this is reflected in its very low average throughput. Like many other rural communities, it is likely that Dauphin's outlets participate in other retail activities and that gasoline represents only a part of their revenues. Otherwise, it would be hard to justify the existence of so many stations.

Dauphin benefited in the early 1990s from the price wars that dominated the gasoline markets in the west, as majors tried to recoup their market share throughout the region. Margins quickly climbed until 1993. They have varied from that point to the present with an average of 10.4 c.p.l. Like most small centres, these margins reflect low volumes and high freight costs. As might be expected, Dauphin's prices track higher than, but in tandem with, those of Winnipeg.

Smithers, British Columbia

Smithers has a population of 6,104 (1999 estimate). It is located 1,150 km from Vancouver, 353 km from Prince Rupert and 371 km from Prince George. Its economy is based on resource industries, dairy farming, regional government and tourism.

In 1999, it had five service stations, for a density of about one station per 1,221 people.

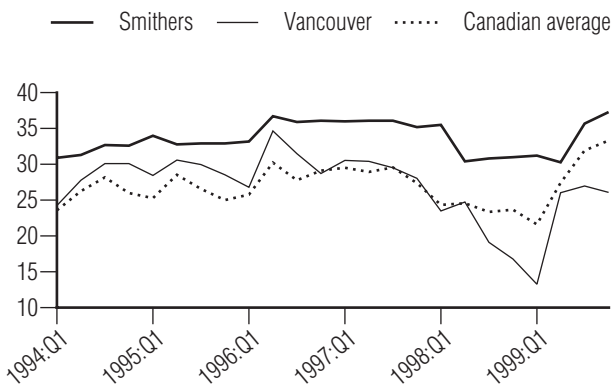
Of the five stations, three are majors and two are regional refiners or are affiliated with their private brands. There are no independent outlets.

The estimated average throughput for Smithers was 2.22 million litres per year in 1999. The average throughput for majors was 2.35 million litres, and for regional refiners and their brands it was 2.03 million litres.

Most of Smithers' gasoline is trucked in from Prince George or shipped from Vancouver to Prince Rupert and trucked into Smithers.

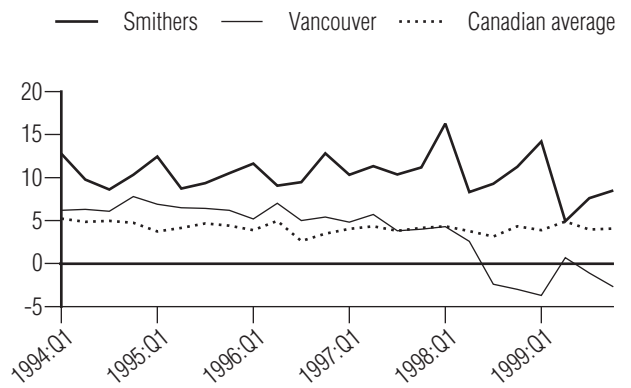
As might be expected for a relatively isolated region with high freight costs, Smithers' retail margin is higher than those of urban centres further south. Based on Vancouver rack prices, Smithers shows an average retail margin of over 10 c.p.l. for the period 1994-99. It did show a decrease of margin in 1999, which may be an indirect result of the price war in Vancouver and the lower mainland.

Chart 46
Retail Price for Smithers (Ex-tax)
(cents per litre)



Source: Kent Marketing and M.J. Ervin.

Chart 47
Retail Margin for Smithers
(cents per litre)



Source: Kent Marketing and M.J. Ervin.

This paper presents an up-to-date profile of the Canadian gasoline industry and attempts to address some of the preoccupations of industry stakeholders and the perceptions of Canadian motorists.

The gasoline industry in Canada follows economic rules of supply and demand over which it has little control. The price of gasoline's major input, crude oil, is determined outside Canada's borders. In addition, even the wholesale price of gasoline in Canada is as much determined by American conditions as it is by cost, supply or demand within our borders.

Rapid increases in retail prices in the 1999–2000 period have been due to a near tripling in the world price of crude oil, as well as daily volatility for both crude prices and futures. As a result, Canadians have seen the highest nominal pump prices ever.

Pump prices vary from one city to the next. However, when taxes are removed from the retail price, we see a commodity that has similar prices across Canada, differentiated predominantly by local competitive conditions, average sales volumes and freight costs.

The gasoline industry in Canada has a limited number of key players, who, through their vertical integration and sheer size, are often expected by the public to have excessive influence in the marketplace. At the same time, we see the vulnerability of these Goliaths to independent Davids and new market entrants, who, with aggressive pricing policies, precipitate price wars that have implications across the entire industry and throughout the country.

It is important to remember that crude oil and taxes make up about 84 per cent of the average price of a litre of regular unleaded gasoline. This

leaves only 16 per cent to cover refining, marketing costs and the retailer's operational and fixed costs. This implies that on average in mid-November 2000, the downstream gasoline industry (refining, marketing and retailing) has influence over just 11.9 cents on a 75.9 cent litre of gasoline. Retailers have even less influence—they can affect approximately only 4.5 cents on the pump price of gasoline.

We shall now summarize the issues that have been raised during our meetings with the stakeholders and reflect on what we have found concerning these questions.

Canadian Perceptions

Consumers

What Consumers Want

Consumers want the lowest possible price consistent with readily available supply when filling up their automobiles. They do not want to pull out of the station with the feeling that someone has "ripped them off." Consumers also want assurance that they are not being gouged by the oil companies simply because they are buying gasoline on weekends or in a different part of the country (i.e., rural communities). They want to ensure that the oil companies are not taking advantage of high world oil prices to make excessive profits on their retail operations.

Consumer Perceptions

Most consumers view the volatility in gasoline prices and the uniform lowering or raising of prices as signs of collusion. When prices suddenly increase by 6–7 c.p.l. in one day, drop just as quickly the next day and then shoot up again later in the week, they feel that oil companies are taking advantage of them and making huge

profits at their expense. If gasoline prices sometimes increase before a long weekend, consumers believe that the system that determines gasoline prices is rigged against them.

Our Findings

The reality in this case is quite different from the perceptions of the typical consumer. Consumers across the country are well served by the current market system that determines gasoline prices. By “well served” we mean that Canadian prices are among the lowest possible, given input costs, and that gasoline is readily available at the gasoline pump.

The decline of retail margins throughout the 1990s (see Chart 4) is proof that consumers are benefiting from improved efficiencies in the industry. The volatility in gasoline prices reflects the unstable market for crude oil and is also a direct result of the fiercely competitive nature of the business at the street level. The unique way that gasoline prices are posted on large signs outside each retail outlet across the country contributes to the volatility. During a price war, dealers must match the lowest price offered in their area or risk losing a large portion of their business. When a dealer finally decides that he is unable to continue to sell his product at a loss and makes up his mind to increase the price, other competitors often (but not always) follow suit in order to earn a more reasonable margin and pay the bills. This uniform increase in prices may look like collusion and gouging, but it is actually the result of retail dealers attempting to run their operations, achieve a fair return on their effort and investment and stay in business.

The difference in prices between rural and urban communities, which in some instances is viewed as being out of line even after transportation costs have been taken into account, demonstrates the importance of sales volumes in determining retail prices. In rural communities, the average throughput at each outlet is generally far lower than that of urban communities. Lower throughputs imply that a dealer must make a higher margin in order to cover fixed costs. In Toronto, it may be possible to make a profit at a busy downtown location with a margin of only 1–2 c.p.l. and sufficiently high

volumes. A retailer in a rural community may need 10 c.p.l. just to survive.

Sometimes retail prices differ between communities in ways that are not immediately obvious. For instance, prices could, for a period of time, be lower in a city that is much further away from a terminal compared to another city with terminal facilities and a similar population. While this may confuse consumers, it is likely that this is brought about by the varying local market conditions that exist in each city in Canada and that can push gasoline prices in directions that diverge from the norm over a short period of time. All it takes is one dealer who is determined to increase market share at the expense of competitors to upset the balance and bring about a situation where retail prices diverge from the norm and bear little resemblance to factors like transportation costs or rack prices.

In response to complaints from politicians and consumer groups, some provinces have enacted legislation to control gasoline prices. While price regulation eliminates the volatility that consumers dislike, the evidence suggests that it does not lead to lower prices. Prince Edward Island regulates gasoline prices, yet, as was discussed earlier, its ex-tax retail prices are generally among the highest in the country. Nevertheless, regulation provides consumers with a feeling of control over prices and the belief that increases are justified and not arbitrary.

Oil companies are profitable, but are their profits out of line for an industry where investments are in the billions of dollars and where upstream activities such as exploration

Table 6
Return on Capital Employed for the Downstream Sector
(per cent)

Year	Petro-Canada	Shell	Imperial Oil
1993	7.1	1.7	9.0
1994	8.1	5.6	8.5
1995	9.0	9.4	7.8
1996	6.8	4.3	6.4
1997	11.1	14.7	12.4
1998	8.5	15.7	11.3
1999	5.2	8.2	2.2

Source: Published Annual Reports.

carry tremendous risks? Table 6 shows the rate of return on capital employed for the majors' downstream operations (refining and retailing). Although profits for 2000 are expected to be high due to higher refining margins, with the exception of 1997–98, returns have been relatively modest (below 10 per cent). While nominal amounts may appear high because of the large amounts of capital involved, returns should more properly be considered as a percentage of capital employed.

There is no empirical proof that gasoline prices increase before long weekends. While it is true that prices do sometimes shoot up before long weekends, they are just as likely to increase prior to any other weekend throughout the year. The fact is that dealers attempt to increase prices in the middle of the week, if the prices have been eroded earlier due to street-level competition, in order to earn a higher margin. If the restoration does not succeed, prices tend to drift down on Friday and on the weekend. This could happen in any season. However, it is more likely to happen in the summer because demand is higher and inventories are lower than in the winter months. Increases before long weekends may be more likely to be accepted by competitors in anticipation of the higher holiday demand, but this cannot be proven statistically.

Major Integrated Oil Companies and Regional Refiners

What the Majors and Regionals Want

The majors and regional refiner-marketers want to earn a reasonable rate of return for their shareholders. They want to ensure that each part of their business—upstream, refinery and retail—operates at a profit. They also would like to be viewed by the Canadian public as being good corporate citizens who contribute to their communities.

Majors' and Regionals' Perceptions

The gasoline majors and regional refiners believe that they are providing consumers with a very competitively priced product, given the increases and volatility in world crude prices. They point to the fact that the ex-tax price of gasoline in Canada and the United States is very similar, even though the majors in Canada must operate

Table 7
World Gasoline Prices in June 2000
(Can. cents per litre)

Country	Retail Price	Ex-tax Retail Price
Canada	74.0	43.6
United States	64.0	48.9
Italy	155.1	56.1
France	158.8	48.7
United Kingdom	183.9	51.1
Spain	118.0	49.5
Germany	152.7	52.7
Japan	147.0	65.4

Source: M.J. Ervin.

in a market that is much smaller than the U.S. market. Canadians enjoy some of the lowest gasoline prices in the world (see Table 7) despite the fact that Canada has a larger geographic area with a smaller population base and higher costs compared with other countries.

The intense competition that has provided consumers with these relatively low prices has led to unsatisfactory downstream earnings by the integrated refiners, with a rate of return of less than 10 per cent.

The majors and regional refiners believe that biggest threat to their future market share comes from the potential increase in the number of big box stores that sell gasoline. They are also concerned about an ever-growing list of environmental regulations that will force them to invest millions of dollars to revamp their refineries and stations. These costs may not be easily recoverable at the pump and further rationalization and change may have to occur.

Despite their belief that they are providing consumers with a competitive product in a marketplace in which it is becoming more and more difficult to compete, the major oil companies and regional refiners feel that they are viewed by the general public and independents as being the "bad guy." When retail gasoline prices increase, they are accused of gouging the public, even though the major component of the price increase is rising crude prices. In 2000, 84 per cent of the retail pump price is made up of crude oil plus taxes. The majors are accused of trying to put the independents out of business when prices decline. When prices are stable, they are accused of

collusion. Yet, no past study carried out by any level of government has uncovered evidence of illegal or anti-competitive behaviour within the gasoline industry.

The majors believe that they are being penalized by public perception. Few consumers understand the pricing of gasoline. Most of them generally view gasoline purchases as an annoying chore that brings little or no gratification.

Our Findings

Major oil companies do co-operate to promote their common interests. They swap gasoline at the refinery level, invest in pipelines and carry out joint public relations efforts through industry associations. Nevertheless, the industry takes great care with proprietary information and pricing policies to avoid the appearance and accusation of collusion. The joint practices of the industry make good business sense and do not violate any laws or regulations.

Retail prices often change in step. We believe this reflects highly competitive street-level competition and protection of market share rather than a conspiracy among companies. Similarly, the setting of rack prices takes into account the same factors for all refiners, and it is natural that prices should rise and fall in tandem. All players in the gasoline industry are motivated by self-interest, and often these interests coincide among participants. Gouging, collusion or predatory pricing would not serve the long-term self-interest of the participants.

Independents

What the Independents Want

The independents want to compete and earn a reasonable rate of return in a market that is fair and where every participant in the industry plays by the same set of rules.

Perception

Many (but not all) of the independents consulted for the purpose of this study believe that the majors have an unfair advantage in the marketplace that stems from their ownership of refineries as well as their size. This

advantage makes it very difficult for independents to compete and, for some, to remain in business. At the wholesale level, it is difficult for some independents to secure a reliable supply of product at a competitive price. The majors' practice of setting rack prices at a competitive level with imports denies them a price advantage that would be possible if rack prices were based on refinery costs. Problems in obtaining cheaper imported supply from the United States are aggravated by the lack of access to a pipeline and new environmental laws concerning benzene levels in gasoline, as well as future Canadian standards for sulphur content that will be out of line with the U.S. timetable for such regulations. Independents believe that the limited number of refiners in Canada leads to oligopolistic pricing practices and that Canadian refiners do not actively compete for the business of independents.

At the retail level, many of the independents claim that the majors cross-subsidize their retail operations to put increasing pressure on their outlets. Currently, with world crude oil prices above Can. \$44 (U.S. \$30) a barrel, the majors are experiencing an unusually high rate of return from the upstream part of their business. It is alleged that they use some of these earnings to subsidize their retail operations by lowering the wholesale price to their branded dealers. This enables the branded dealers to charge a lower retail price, and the independents are forced to follow suit.

Since the independents do not have upstream revenue to support their operations, lower retail prices have forced some of them to close stations or consider leaving the business. Similarly, they believe that the branded dealers of the major and regional-refiners are subsidized. They think that the branded dealers receive gasoline at prices significantly lower than those available to independents through lower wholesale prices that are intended to guarantee margins during price wars or in areas of zone pricing.

Some of the independents contend that the long-term goal of the majors is to subsidize their retail operations to the point where the squeezed margins will eventually force all independents out of business. Once this has been accomplished, the majors will be in a position to increase margins back to the levels that existed in the 1980s,

given that there will be far fewer competitors with which to contend. The independents feel that the threat posed by the big box stores is greatly exaggerated by the majors. They believe that the difficulty in obtaining municipal zoning for gasoline outlets (which can sometimes take two years) combined with the poor margins that currently exist in the industry make it unlikely that the trend towards superstores selling gasoline will spread quickly throughout Canada.

Our Findings

The reality for most independents is that imported supply from the United States will become increasingly difficult to secure once the new environmental laws take hold. While the Canadian refining industry is highly concentrated, it must, by necessity, remain competitive with U.S. refineries. Rack prices that are competitive with U.S. markets work to the disadvantage of the independents in terms of imports, but do provide them with lower-cost domestic supply than might otherwise be the case. Regardless, the setting of rack prices based on U.S. wholesale markets makes sound economic sense to the majors, given the huge investment that refineries require. As a result, Canadian motorists pay a lower retail price for gasoline.

It is our judgement that cross-subsidization exists to some extent between the different activities undertaken in the gasoline industry. However, the inter-financing of activities is neither illegal nor unusual as a business practice across the Canadian economy. Moreover, our empirical work could not find conclusive evidence of either the extent or magnitude of cross-subsidization, given the data that are available. The lack of information about the actual prices paid by most retail dealers for their supply makes it impossible to draw any definitive conclusions on this issue.

The majors' argument that each portion of their business (upstream, refinery and retail) must make a suitable rate of return on capital appears to be realistic. However, there is no doubt that during a price war the majors support their dealers by temporarily providing them with a lower wholesale price. This gives their dealers a significant advantage because independent competitors are not

in a bargaining position to receive a large enough rack price discount to sustain an extended price war. The degree to which this practice persists in the industry is a source of contention: the majors claim that it is done on an infrequent basis, while the independents contend that it is widespread. The lack of transparency in the actual supply cost for stations affiliated with major and regional refiner-marketers makes it impossible to reach a conclusion on the extent of the practice.

Independents are also at a disadvantage in that their margins are based on rack price. Major and regional refiner-owned stations use an internal acquisition price, which hides what their real margin might be.

Major and regional refiners have an advantage over independents in terms of tax collection. Independents must pay the excise taxes (federal and provincial) on gasoline immediately upon delivery of the wholesale product. On the other hand, branded dealers pay the excise taxes only after the product is sold at the retail level. This gives the branded dealers a cash flow advantage over the independents.

The potential entry of mass merchandisers into the market is another source of contention. This segment of the industry grew throughout the 1990s, yet it is difficult to predict what will happen in this decade. The majors and some independents contend that the sale of gasoline at mass merchandisers will continue to grow because it is a relatively inexpensive business to enter once the store has been constructed. Also, because of the large throughput that can be attained at these sites, it is possible to make a suitable rate of return with a relatively low margin (2-3 c.p.l.). Issuing coupons to customers from the retail outlet to be used at service stations, or vice versa, is an attractive option for the mass merchandisers.

Some independents argue that low margins in the industry and zoning laws will stall growth in this segment of the industry, and this argument has some merit. However, some independents are minimizing the threat posed by mass merchandisers. Simply because the rate of return on the gasoline portion of the business is lower than the return for non-gasoline products does not imply that the

decision to invest in a new gasoline outlet makes no economic sense. A merchant may decide to open a service station, even though the margins are low, because the additional traffic that it creates could lead to increased Big box sales in other parts of the operation. Big box operators may also gain an advantage in the market by introducing cutting-edge technology that will allow them additional efficiencies. Based on the experiences of other countries, the big box store phenomenon probably will continue to expand in Canada.

Independents cannot escape the reality that the rationalization and cost cutting that took place in the 1990s will continue in the present decade. To survive, they will have to become more efficient largely through increased throughput. In the 1990s, the major oil companies took the lessons of the independents about ancillary sales and services as well as lower prices and expanded upon them. If the traditional independents wish to survive in the 21st century, they will have to continue to look for ways to innovate in order to remain competitive.

Sources of Data

Kent Marketing, through Industry Canada, supplied the Conference Board with data dealing with throughputs, the number of outlets and classification of the outlets (i.e., major, regional and independent) at the city level. The Kent data included gasoline volumes from the independents as well as from the majors and regional refiners. The primary source of retail price data was M.J. Ervin. Data on wholesale prices came from Bloomberg, one of several available sources. Statistics Canada provided the demographic data.

Price Consistency

The Kent Marketing data dealing with throughputs were collected on a bimonthly basis for the larger cities analyzed in this study. However, for some of the smaller centres, the data were collected on a quarterly basis. The M.J. Ervin price retail data for small centres were also collected quarterly. As a result, regression analysis was not conducted on the smaller cities, as quarterly data does not capture the frequency of changes in retail prices that is required for a meaningful analysis.

Price Volatility

The retail gasoline industry is characterized by tremendous price volatility. It is not unusual for retail outlets to change their prices two or three times a day, especially in the middle of a price war. The industry is also characterized by price increases that tend to take place in some cities on the same day of the week and in other cities on a different day. For this reason, some of the stakeholders recommended that we use daily data in the empirical analysis. However, there is an important trade-off involved, in that daily data in this industry are so volatile that it is virtually impossible to draw meaningful conclusions from regression analysis, which is designed to explain price changes. The use

of monthly data was the optimal choice in order to conduct the wholesale and retail regressions. We are confident that the empirical analysis of the monthly data enabled us to arrive at meaningful conclusions that were in line with what actually happens in the industry on a day-to-day basis.

Margins

Looking at changes over time in the retail margins is a powerful way to analyze the retail gasoline industry. The retail margin is the difference between the ex-tax price of gasoline charged at the pump and the rack price. In this study, the results revealed that retail margins declined in most cities in the early part of the 1990s and then levelled off in the mid and latter part of the decade. The retail margins in this study are understated by an amount that is impossible to quantify. This is because of the industry's widespread practice of offering discounts on the rack price or else using internal market acquisition prices for consignment or supplier-owned gasoline. For the purposes of running regressions, the understated retail margins do not pose a significant problem, given that the discount price is a function of the posted rack price. Consequently, variations in the data should balance out.

Independents

The definition of an independent is a contentious issue in the industry. The Kent Marketing data that were used in this study classified any operator in the industry that did not have a refining ability as an independent. All other companies were classified as either regional or major companies, depending on the type of refining operations that they owned. For instance, Irving is classified as a regional operation because its refining capacity resides in only one part of the country. Petro-Canada and Imperial Oil, on the other hand, are classified as

majors because they own refineries in different parts of the country. IRGMA claims that the classification employed by Kent distorts the data because it fails to take into account some of the unique relationships in the industry.

Pioneer, for instance, is classified as an independent operator because it does not have a refining capability. However, Sunoco owns 50 per cent of this company. IRGMA argues that even though Pioneer does not have a refinery, its relationship with Sunoco enables it to have a secure access to supply and preferential discounts that are not available to other independents. The fact that Kent classifies Pioneer as an independent is erroneous, according to IRGMA, and the data on the market share of independents are distorted because Pioneer is included in this category. If Pioneer were not included as an independent, IRGMA contends that the overall picture of the changes in the market share of independents over the past decade would be more accurate.

During the stakeholder dialogues, the Conference Board also heard arguments in favour of classifying Pioneer as an

independent. Representatives from Pioneer and Sunoco indicated that the 50 per cent ownership did not provide Pioneer with any special status in terms of price discounts. It was also noted that the aggressive pricing policies of Pioneer were more in line with how independent dealers operated, rather than integrated refiner-marketers.

In this study, Pioneer is considered to be an independent mainly because of its aggressive pricing policies. However, because of its unique relationship with Sunoco, the data dealing with market share for the independents in the cities where Pioneer is a player both includes and excludes Pioneer volumes.

Kent also classifies the mass merchandisers as independents, as they do not have refining capabilities. However, their huge throughputs, a result of their traffic, places them in a different segment of the market compared with most independents. As a result, in the city analysis, data for the average throughputs of independents are provided both with and without the volume sales of the mass merchandisers.

Detailed Methodology and Statistical Results

APPENDIX B

This study of the gasoline industry in Canada represents the culmination of more than six months of intensive research undertaken by The Conference Board of Canada. During the initial phase that started in April 2000, the Board held discussions with many stakeholders in the industry from every region of the country. The meetings included those with major and regional refiner-marketers and both large and small independent operators. Associations that represent consumers, independents and refiner-marketers were also contacted, as were individual station owners, employees and interested Canadian consumers.

As a result of these pre-research consultations, seven specific research questions were identified:

1. What is the relationship between wholesale prices and crude oil price changes?
2. What is the relationship between Canadian and U.S. rack prices?
3. What is the relationship between retail and wholesale gasoline prices?
4. Do retail prices change asymmetrically with wholesale price increases?
5. How do average sales volumes affect retail gasoline margins?
6. Do gasoline prices go up before long weekends?
7. Is there cross-subsidization between the upstream and refining sectors and the retail operations of integrated refiner-marketers?

Wholesale Regressions

Question 1: What is the relationship between wholesale prices and crude oil price changes?

Relationship between U.S. Wholesale Prices and Crude Oil

Before examining the factors that have an impact on Canadian wholesale prices for

gasoline, it was important to establish a relationship between U.S. wholesale and crude oil prices. As will be seen below, Canadian wholesale prices are heavily influenced by U.S. wholesale prices, which, in turn, are directly tied to crude oil price swings.

$$\Delta W_t^{NY} = \beta_1(\Delta WTI_t),$$

Where:

ΔW_t^{NY} is the change in U.S. wholesale prices in New York over a one-month period, and

ΔWTI is the change in the West Texas Intermediate price of crude oil over a one-month period.

A positive relationship between wholesale and crude oil was to be anticipated, given the fact that crude oil is the primary input into the production of gasoline. The equation was estimated using Ordinary Least Squares (OLS) with monthly data for the period of February 1993 to April 1999.

Results

The results are shown in Table 8. The t-statistics are in parentheses below the estimated coefficient.

The results show that the wholesale price of gasoline has a significant correlation to crude oil prices. The R^2 of 0.463 is high for a first

Table 8
Results of the Wholesale Regression

Variable	Estimated coefficient
Crude Oil (ΔWTI)	1.124 (7.982)
Adjusted R^2	0.463
Durbin-Watson	2.365

Source: The Conference Board of Canada.

difference equation. The coefficient of 1.124 suggests that a one cent per litre increase (decrease) in the price of crude oil (one barrel of crude oil equals 159 litres) causes an increase (decrease) of slightly more than one cent per litre in the price of U.S. wholesale gasoline.

Canadian Wholesale Prices

Question 2: What is the relationship between Canadian and U.S. rack prices?

During the stakeholder dialogues, it was pointed out that wholesale prices in Canada are closely related to U.S. wholesale prices because of the trade in gasoline across the Canada–United States border. In order to test for this relationship, the following equation was developed:

$$\Delta W_t = \beta_1(\Delta W_t^{NY}) + \beta_2(\Delta W_{t-1}^{NY}),$$

Where:

ΔW is the change in the Canadian wholesale price over a one-month period, and

ΔW^{NY} is the change in the American price over a one-month period.

All prices are in Canadian dollars.

The wholesale price in New York City was chosen because prices in other wholesale markets in the United States are closely aligned to it. These estimations were done by OLS on a city-by-city basis using monthly data for the time period covering March 1993 to April 1999. A lag on the New York wholesale price was included to account for the possibility that U.S. wholesale prices in the past month may have an influence on current Canadian wholesale prices. It would be expected that the signs of the two coefficients should be positive since higher (lower) wholesale prices in the United States should result in higher (lower) wholesale prices in Canada.

It could be argued that crude oil prices should be included in the equation as an independent variable as opposed to U.S. wholesale prices. Canada is a price taker in international markets and, consequently, crude prices should have just as much of an influence on Canadian wholesale

prices as they do on U.S. wholesale prices. However, it was felt that U.S. wholesale prices were a better indicator since, over time, they account for gains in efficiency in the U.S. refinery industry that would not necessarily be captured with the crude oil price.

Results

The results of the regression are shown in Table 9 (the t-statistics are in parentheses).

The results indicate that the U.S. wholesale price, both present and lagged one month, are significant in explaining the movement in Canadian wholesale prices for all 11 cities. The sum of the coefficients is close to one for most of the cities, with the exception of Calgary, Regina and Winnipeg. This implies that a one cent per litre increase (decrease) in wholesale prices in the United States results over a one-month period in a one cent per litre increase (decrease) in Canadian wholesale prices. The fact that the coefficients for the three cities in the Prairies did not add up to one could be explained by the greater difficulty in obtaining imported wholesale gasoline from the United States compared with the situation in eastern Canada and Vancouver.

The close relationship between Canadian and U.S. wholesale prices is not surprising. The majors in Canada closely monitor U.S. wholesale prices and must set their prices to remain competitive with imported gasoline. If Canadian wholesale prices were not competitive with U.S. prices, imported product would flood the Canadian market and hurt the refinery business in Canada.

Retail Regressions

Question 3: What is the relationship between retail and wholesale gasoline prices?

The ex-tax retail price in Canada should be heavily influenced by changes in wholesale prices. The retail margin is the other factor that should influence retail prices. If a dealer is operating with a low margin, possibly because of a price war, the change in the retail price in reaction to a change in the wholesale price may differ compared with the adjustment that would occur if the retail margin were at a higher level.

Table 9
Results of the Canadian Wholesale Regressions

City	Estimated Coefficients			Adjusted R ²
	Period t	Period t-1	Sum	
Calgary	0.465 (10.196)	0.317 (6.811)	0.782	0.666
Halifax	0.808 (19.539)	0.256 (6.136)	1.064	0.850
Montreal	0.810 (19.375)	0.103 (2.409)	0.913	0.838
Ottawa	0.829 (19.320)	0.137 (3.126)	0.966	0.839
Quebec City	0.828 (18.886)	0.099 (2.203)	0.927	0.831
Regina	0.466 10.294)	0.316 (6.837)	0.782	0.670
Saint John	0.803 (19.273)	0.237 (5.579)	1.040	0.844
St. John's	0.809 (18.804)	0.285 (6.488)	1.094	0.844
Toronto	0.871 (20.707)	0.203 (4.717)	1.074	0.859
Vancouver	0.500 (6.060)	0.497 (5.902)	0.997	0.485
Winnipeg	0.470 (10.563)	0.317 (6.986)	0.787	0.681

Source: The Conference Board of Canada.

This equation was used to test this assumption:

$$\Delta R_t = \beta_1(\Delta W_t) + \beta_2(\Delta W_{t-1}) + \beta_3(\Delta W_{t-2}) + \beta_4[(R_{t-1} - W_{t-1}) - (R - W)^*],$$

Where:

ΔR is the change in the retail price over a one-month period,

ΔW is the change in the wholesale price over a one-month period, and

$[(R - W) - (R - W)^*]$ is the error-correction term.

It was expected that the sign on the present and lagged wholesale price would be positive, indicating that higher wholesale prices are associated with higher retail prices. The error-correction term is the difference between the one-period lag of the retail margin and what is referred to as a market outcome margin. The market outcome

margin can be thought of as a margin, determined by local competitive conditions, that exists and that does not provide an incentive for dealers to either enter or exit the industry. It is a retail margin that, in a sense, is acceptable to the current players in a market providing a "fair or decent" rate of return for their efforts and investment. For most of the cities, margins declined in the early part of the decade and then levelled off. Average margins were calculated over periods where the margins generally moved in the same direction (i.e., increasing, decreasing or remaining level). These were then referred to as the market outcome margin.

The purpose of the market outcome margin is to capture the effect that retailers consider the existing market outcome margin and take this into account when adjusting retail prices in response to a change in wholesale prices. For example, if the wholesale price increases by a cent and the current retail margin is above the market

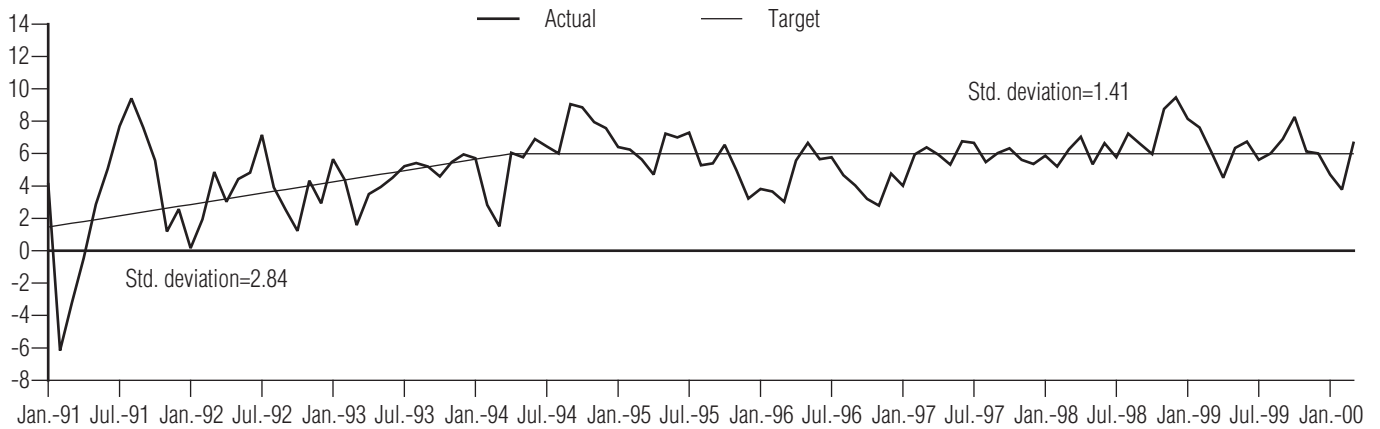
outcome margin, then the dealer may adjust the retail price by less than a cent, given that the retail margin is at a high level. Conversely, the dealer might increase the retail price by more than a cent if the retail margin is below the market outcome margin. Consequently, the expected sign of the error-correction term should be negative.

The estimations are done using OLS on a city-by-city basis with monthly data from January 1991 to March 2000.

Market Outcome Margins

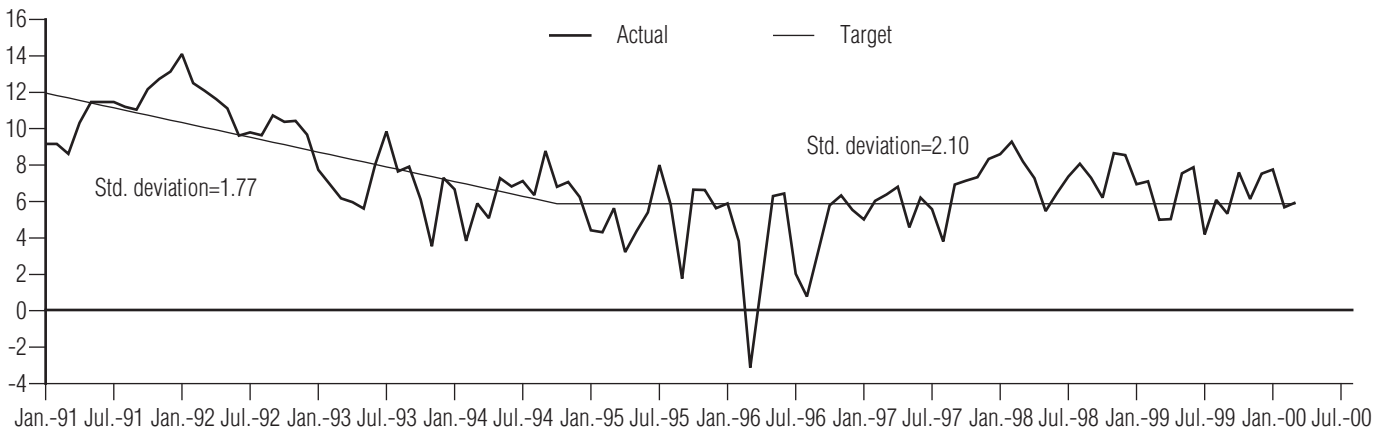
The market outcome margins used in the estimations are shown on a city-by-city basis in the following charts. Also included in the charts are the standard errors for the actual margin for each of the periods under consideration. These standard errors are a measure of volatility. It is clear that in eight cities, there was less volatility in the latter part of the 1990s than in the earlier part.

Chart 48
Retail Market Outcome Margin for Calgary
 (cents per litre)



Sources: M.J. Ervin and The Conference Board of Canada.

Chart 49
Retail Market Outcome Margin for Halifax
 (cents per litre)

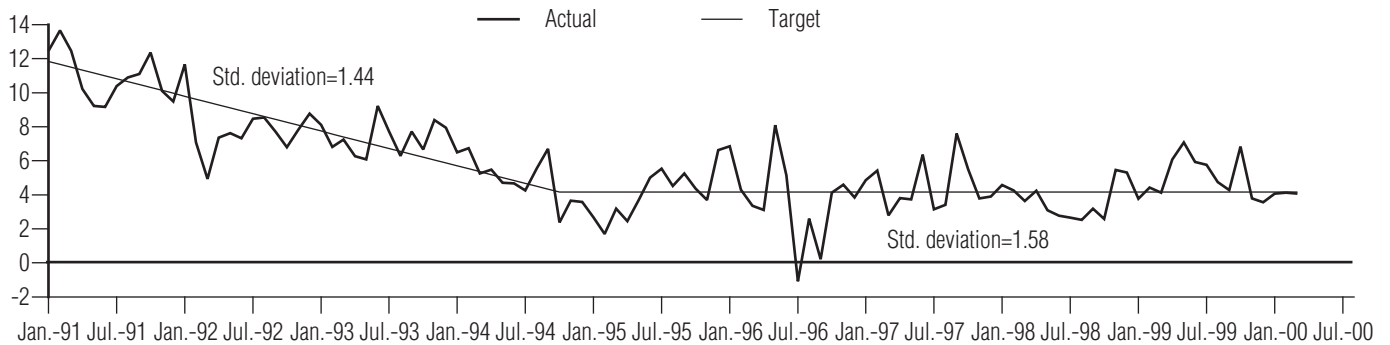


Sources: M.J. Ervin and The Conference Board of Canada.

Chart 50

Retail Market Outcome Margin for Montreal

(cents per litre)

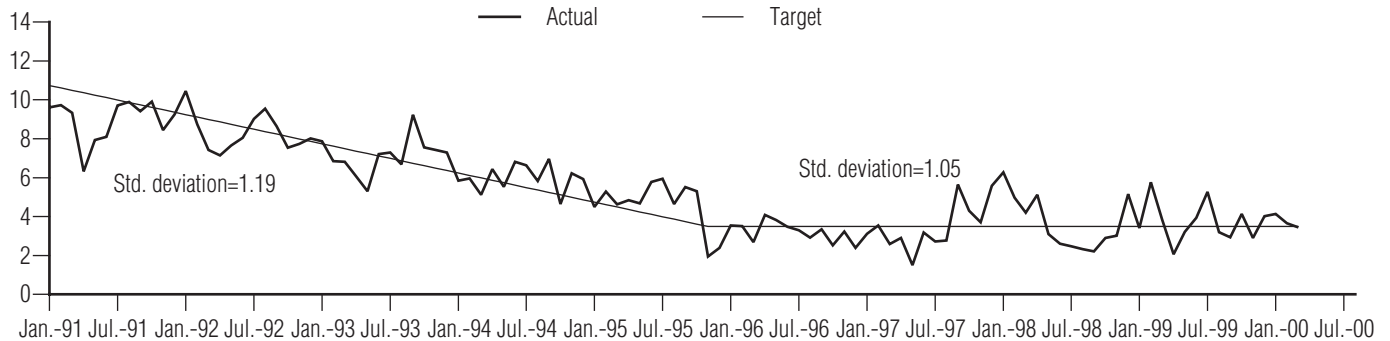


Sources: M.J. Ervin and The Conference Board of Canada.

Chart 51

Retail Market Outcome Margin for Ottawa

(cents per litre)

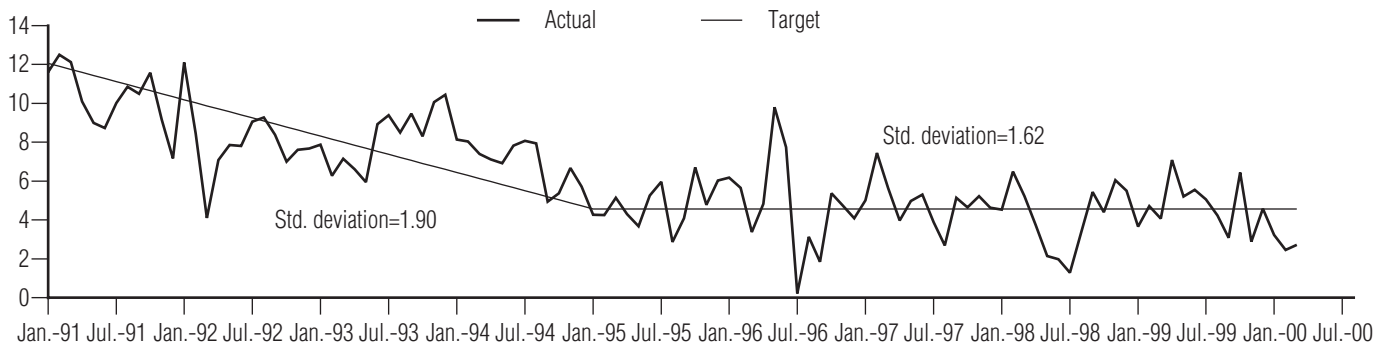


Sources: M.J. Ervin and The Conference Board of Canada.

Chart 52

Retail Market Outcome Margin for Quebec City

(cents per litre)

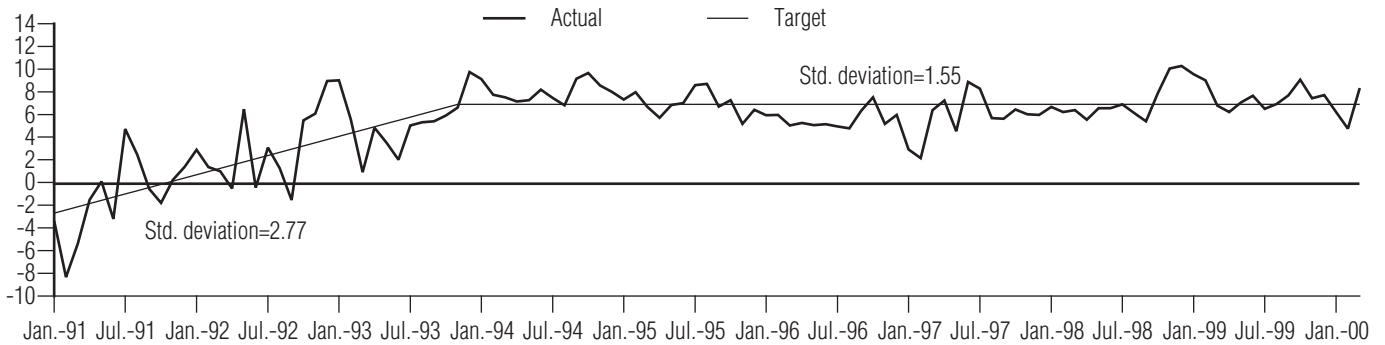


Sources: M.J. Ervin and The Conference Board of Canada.

Chart 53

Retail Market Outcome Margin for Regina

(cents per litre)

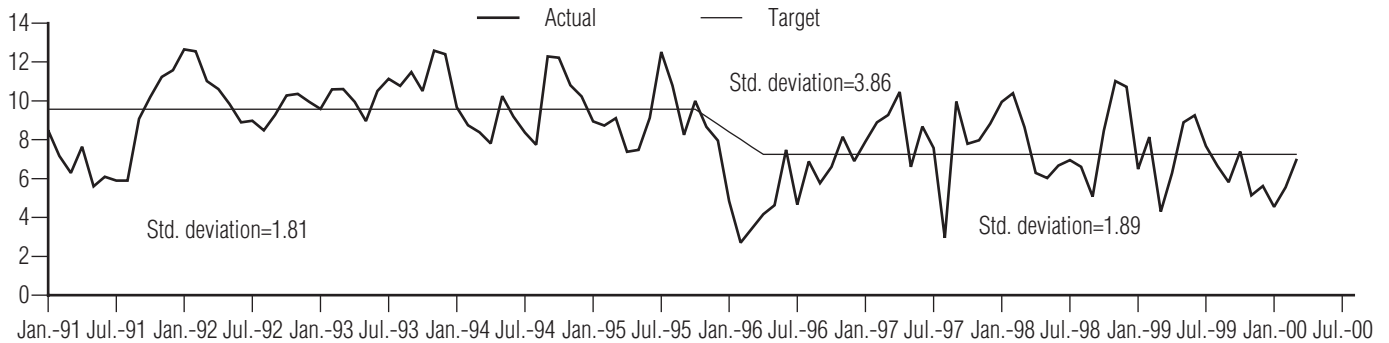


Sources: M.J. Ervin and The Conference Board of Canada.

Chart 54

Retail Market Outcome Margin for Saint John

(cents per litre)

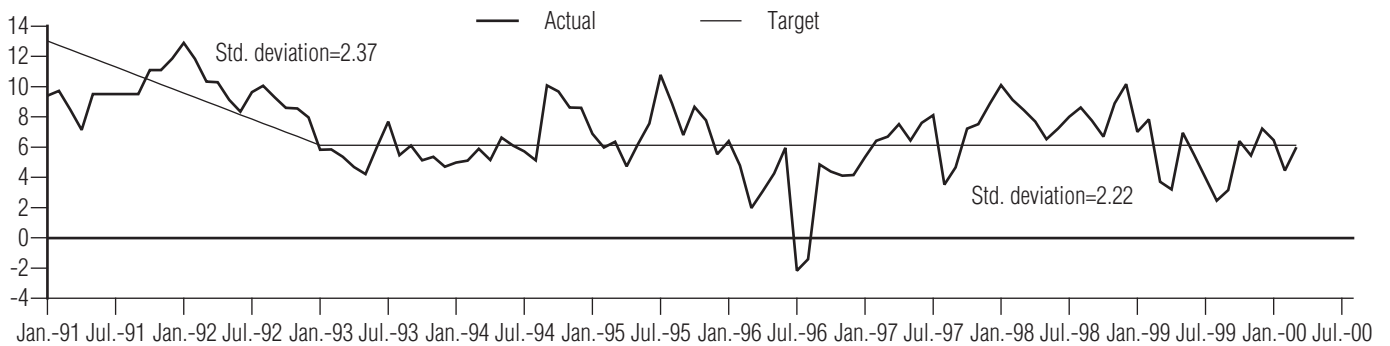


Sources: M.J. Ervin and The Conference Board of Canada.

Chart 55

Retail Market Outcome Margin for St. John's

(cents per litre)

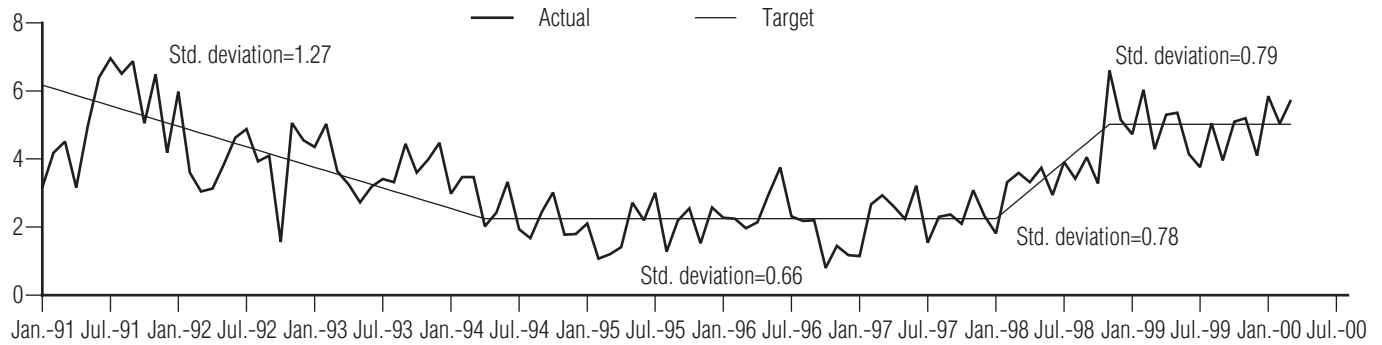


Sources: M.J. Ervin and The Conference Board of Canada.

Chart 56

Retail Market Outcome Margin for Toronto

(cents per litre)

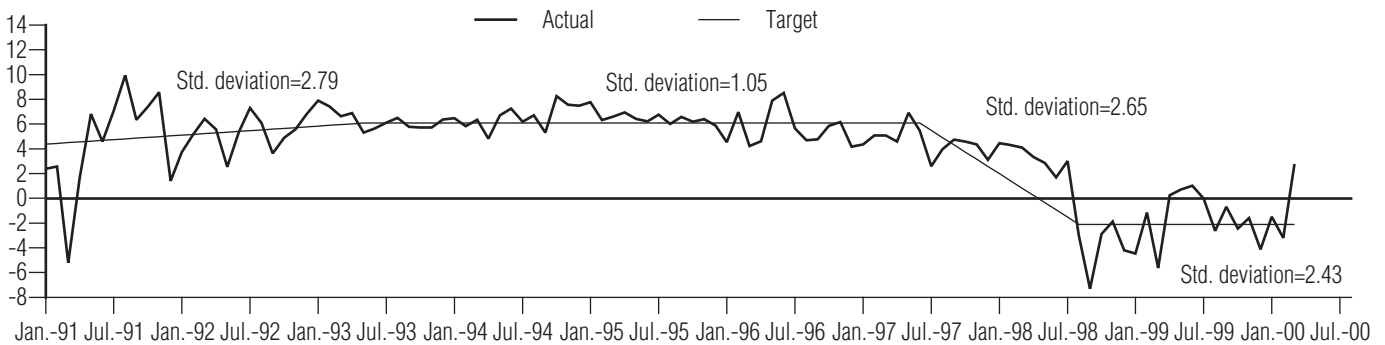


Sources: M.J. Ervin and The Conference Board of Canada.

Chart 57

Retail Market Outcome Margin for Vancouver

(cents per litre)

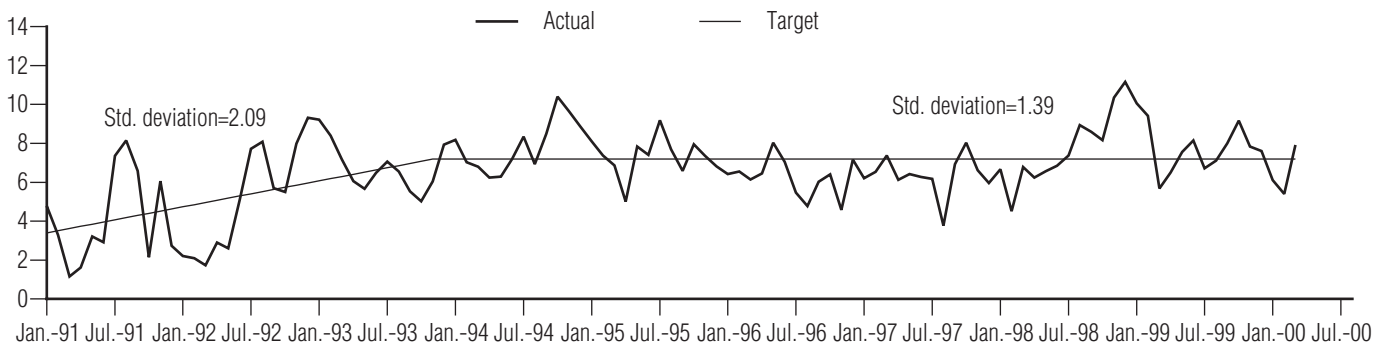


Sources: M.J. Ervin and The Conference Board of Canada.

Chart 58

Retail Market Outcome Margin for Winnipeg

(cents per litre)



Sources: M.J. Ervin and The Conference Board of Canada.

Results

The results of the retail regressions reveal that present and lagged wholesale prices as well as the error-correction term are significant in explaining changes in retail prices for the 11 cities. All of the coefficients, including the error-correction term, have the expected sign. The t-statistics are shown in parentheses.

The passthrough rate for most of the cities is very close to one. This means that a one cent per litre increase (decrease) in the price of wholesale gasoline leads to a one cent per litre increase (decrease) in the retail price over the adjustment period. The only exceptions are cities located in the Atlantic provinces and Regina, where the

passthrough rates are below 0.90. The adjustment period is different from city to city. The adjustment is immediate in Calgary, Vancouver and Regina, while it takes approximately a month to adjust in Montreal, Ottawa, Quebec City, Saint John, Toronto and Winnipeg. Halifax and St. John's are the only cities that take two months to adjust.

To summarize, a variation in the retail price of gasoline is generally explained by the variation in the wholesale price if dealers in a particular city are operating close to the market outcome margin. However, if the margin is above that of the market outcome, the increase in wholesale prices is not reflected entirely in the retail price. Conversely, if the margin is below that of the market outcome, the increase in retail prices may be higher than the original change in the wholesale price.

Table 10
Results of the Retail Regressions

City	Estimated Coefficients					Adjusted R ²
	Period t	Period t-1	Period t-2	Sum	Market Outcome Margin	
Calgary	0.947 (8.064)	—	—	0.947	-0.447 (-5.625)	0.457
Halifax	0.463 (5.561)	0.278 (3.026)	0.144 (1.718)	0.885	-0.372 (-5.173)	0.479
Montreal	0.626 (8.534)	0.410 (5.086)	—	1.036	-0.520 (-6.302)	0.647
Ottawa	0.753 (13.973)	0.213 (3.798)	—	0.996	-0.428 (-5.439)	0.703
Quebec City	0.652 (7.400)	0.269 (2.927)	—	0.921	-0.497 (-5.938)	0.525
Regina	0.835 (6.399)	—	—	0.835	-0.624 (-6.975)	0.433
Saint John	0.406 (5.498)	0.453 (5.335)	—	0.859	-0.254 (-3.755)	0.528
St. John's	0.362 (4.700)	0.328 (3.859)	0.123 (1.599)	0.813	-0.248 (-4.226)	0.452
Toronto	0.865 (18.293)	0.088 (1.806)	—	0.953	-0.675 (-7.867)	0.797
Vancouver	1.096 (1.056)	—	—	1.096	-0.664 (-7.339)	0.569
Winnipeg	0.570 (5.359)	0.368 (3.575)	—	0.938	-0.364 (-4.874)	0.501

Source: The Conference Board of Canada.

Price Asymmetry

Question 4: Do retail prices change asymmetrically with wholesale price increases?

Price asymmetry in retail gasoline pricing refers to the phenomenon of retail prices responding more strongly to increases in crude oil prices than to decreases. It can be a result of market power or other reasons, such as inventory management or consumer response to changing prices. The model estimated to test for asymmetry was:

$$\Delta R_t = \beta_1(\Delta W_t) + \beta_2(\Delta W_t \times D1),$$

Where:

ΔR is the first difference in the retail price, the change in the retail price over a one-month period,

ΔW is the first difference in the wholesale price, the change in the wholesale price over a one-month period, and

$D1$ is the dummy variable to account for an increase in the price of wholesale gasoline. It is equal to one if the variation is positive and to zero if it is not.

The equation regresses the variation in the retail price on a variation of the wholesale price. A dummy variable equal to one is used when wholesale prices increase, and a value of zero is applied when wholesale prices decrease. If asymmetry is present, then the coefficient for the dummy variable should be significant. The estimations use OLS on a city-by-city basis with data for the period from January 1991 to March 2000.

Results

The results are shown in Table 11, with the t-statistic in parentheses.

None of the coefficients for the dummy variable are significant. The hypothesis of an asymmetric response pattern is rejected. Retailers appear to have adjusted their prices in the same manner for both increases and decreases in crude oil prices in the 1990s.

Table 11
Results of the Asymmetry Regressions

City	Estimated coefficient	Coefficient	Adjusted R ²
Calgary	0.946 (5.202)	-0.072 (-0.271)	0.297
Halifax	0.479 (3.377)	0.117 (0.594)	0.213
Montreal	0.646 (4.462)	0.117 (0.580)	0.307
Ottawa	0.736 (7.644)	0.044 (0.335)	0.554
Quebec City	0.723 (4.722)	-0.049 (-0.233)	0.281
Regina	0.747 (3.489)	0.075 (0.237)	0.179
Saint John	0.418 (3.081)	0.149 (0.789)	0.198
St. John's	0.426 (3.242)	0.073 (0.402)	0.188
Toronto	0.824 (9.575)	0.138 (1.148)	0.668
Vancouver	0.850 (4.279)	0.322 (1.219)	0.363
Winnipeg	0.771 (5.415)	0.069 (0.331)	0.349

Source: The Conference Board of Canada.

Margin Analysis

Question 5: How do average sales volumes affect retail gasoline margins?

The objective of the margin analysis is to explain why certain cities in Canada have lower margins than others. The factors that should have an impact on retail margins include the previous month's margin, average throughput, population density by station and average income. The margin in the previous month obviously has an influence on the current time period, while average throughput is important because a dealer can stay in business with a lower margin if the throughput is higher. Population density by station should be significant, since a higher density should be associated with more trips to the outlet. Income could also be an important indicator of retail margins.

Equations were tested using these variables for all of the cities. It turned out that the average income was not

significant, and to discover this, the following equation was used:

$$MR_{i,t} = \alpha + \beta_1 MR_{i,t-1} + \beta_2 AVGT_{i,t} + \beta_3 DENS_{i,t}$$

Where:

α is the constant,

MR is the retail margin,

$AVGT$ is the average throughput by station, and

$DENS$ is the population density by station.

The sign and the lagged retail margin should be positive, while the sign on average throughput should be negative. Higher retail margins should be associated with lower throughputs. The sign on the average density variable should also be negative since higher density per station should be associated with more consumers using the outlet to buy ancillary goods. As a result, the dealer in a city with higher density can survive with a lower margin. In other words, density is a proxy for the presence of other-than-gasoline services and revenues.

The estimation was done by OLS with monthly pooled data so that random events that may be specific to a certain city or time period are averaged out. Furthermore, the estimation was done with and without the density variable to ensure that it was not capturing the same effects as volumes per station. The coefficient on throughput did not change when density was included or excluded so we conclude it is capturing something other than volumes.

Results

Table 12 contains the results obtained from the regression. Once again, the t-statistics are in parentheses below the coefficient.

The coefficients are all significant and have the expected signs. Average throughput per station and population density are important factors in explaining the variation in margins from city to city. The fact that the average income was insignificant suggests that gasoline is a commodity that people consume, regardless of income.

Table 12
Results of the Margin Analysis

Estimated coefficient	Variable
Constant (α)	2.335 (8.606)
Retail Margin ($MR(-1)$)	0.770 (41.555)
Average Throughput ($AVGT$)	-3.99E(-6) (-2.549)
Density by Station ($DENS$)	-1.14E(-4) (-1.705)
Adjusted R ²	0.668
Durbin-Watson	2.163

Source: The Conference Board of Canada.

Long Weekends

Question 6: Do gasoline prices rise before long weekends?

One of the consumers' biggest complaints is their perception that prices soar immediately before long weekends. The general public suspects that the industry is taking advantage of consumers by increasing prices at a time when car travel is at its highest. To test for this phenomenon, regressions on weekly data were carried out for a number of different cities.

The equation used to test for price increases before long weekends was:

$$R_{i,t} = \beta_1 W_{i,t} + \beta_2 D_t$$

Where:

R is the retail price,

W is the wholesale price, and

D is a dummy variable to account for the long weekends.

The regressions were run using weekly data in order to account for the time period prior to long weekends. A value of one was assigned to the dummy variable in the week immediately before the long weekend in May, August, September and October. If retail prices increase before long weekends, the dummy variable should be

significant and have a positive sign. Six cities were chosen for the survey: Vancouver, Calgary, Winnipeg, Toronto, Ottawa and Saint John, and the selected time period was the first week in 1997 to the end of May 2000. The data for these cities were pooled.

Results

As shown in Table 13, wholesale prices were a significant factor in explaining weekly retail price movements. However, the dummy variable for long weekends was not significant and it had a negative sign. The equation included a factor to correct for autocorrelation. The t-statistics are in parentheses below the estimated coefficients.

Table 13
Results of the Long Weekend Analysis

Variable	Estimated coefficient
Wholesale (<i>W</i>)	0.841 (25.634)
Dummy (<i>D</i>)	-0.140 (-0.749)
AR(1)	0.677 (28.972)
Adjusted R ²	0.888
Durbin-Watson	2.432

Source: The Conference Board of Canada.

Do the results imply that consumers are mistaken in believing that gasoline prices increase prior to long weekends? The answer is no. The results reveal that prices are just as likely to go up before any weekend, including long weekends. This is in line with the view that dealers attempt many price restorations throughout the course of a year and that they are more likely to take place in the summer months when demand for gasoline is highest and inventories are low.

Cross-Subsidization

Question 7: Is there cross-subsidization between the upstream and refining sectors and the retail operations of integrated refiner-marketers?

Some of the independent retailers consulted during the stakeholder dialogues claimed that the majors used profits

from the upstream or refinery portion of their business to subsidize prices at the retail level at their branded stations. They alleged that world crude oil prices hovering above Can. \$44 (U.S. \$30) a barrel make it possible for the majors to divert revenue from other parts of the business to their retail operations and squeeze margins in order to place additional competitive pressures on independent retailers.

To test for cross-subsidization, two sets of regressions were run for 11 Canadian cities. The first equation was:

$$MR_{i,t} = \alpha + \beta_1 MR_{i,t-1} + \beta_2 MW_{i,t}$$

Where:

α is the constant,

MR is the retail margin, and

MW is the wholesale margin.

The second equation estimated was:

$$MR_{i,t} = \alpha + \beta_1 MR_{i,t-1} + \beta_2 CRUDE_{i,t}$$

Where:

α is the constant,

MR is the retail margin, and

$CRUDE$ is the price of crude oil.

The first equation regressed the retail margin on the wholesale margin and the retail margin lagged by one month. The latter was included to improve the explanatory power of the overall equation. If cross-subsidization occurred, there should be a negative relationship between wholesale and retail margins. This would indicate that the majors use revenue from high wholesale margins to squeeze retail margins.

If the majors divert revenue from upstream operations to the retail sector, there should be a negative relationship between crude oil and the retail margins. The sign on crude should then be negative. This is tested in the second equation. Once again, a lagged dependent variable was used to improve the explanatory power of the overall equation.

Results

The results of the regressions are shown in the following tables (the t-statistics are in parentheses below the coefficients).

In the first equation, while the sign of the coefficient was negative, it was not significant, indicating that cross-subsidization cannot be proven to occur in the selected cities.

In the second equation, the sign on crude was both negative and significant, indicating that cross-subsidization occurs. However, the size of the coefficient indicates that the cross-subsidization is minuscule. The coefficient of 0.004 implies that a one cent per litre increase in crude prices leads to a 0.004-cent decrease in retail margins.

Price Volatility

Chart 59 shows the average crude oil, rack and retail gasoline prices in Canada from January 1991 to August 2000. The data are monthly averages for the three series. The standard deviations are calculated and shown in the chart. The standard deviation for crude oil is smaller than for retail and rack prices, demonstrating that crude oil is the least volatile of the three. Retail price shows the largest standard deviation, and thus is the most volatile.

This result as to be expected as retail price is subject to shocks at the crude and rack levels, as well as at the street level. However, the standard deviations for retail prices and rack prices are very similar, which indicates that variation in rack prices is behind the variation in retail prices.

Table 14
Results of the Cross-Subsidization Analysis
(First Equation)

Variable	Estimated coefficient
Constant (α)	1.288 (6.811)
Wholesale margin (MW)	-0.020 (-0.923)
Retail margin ($MR(-1)$)	0.800 (47.654)
Adjusted R2	0.648
Durbin-Watson	2.176

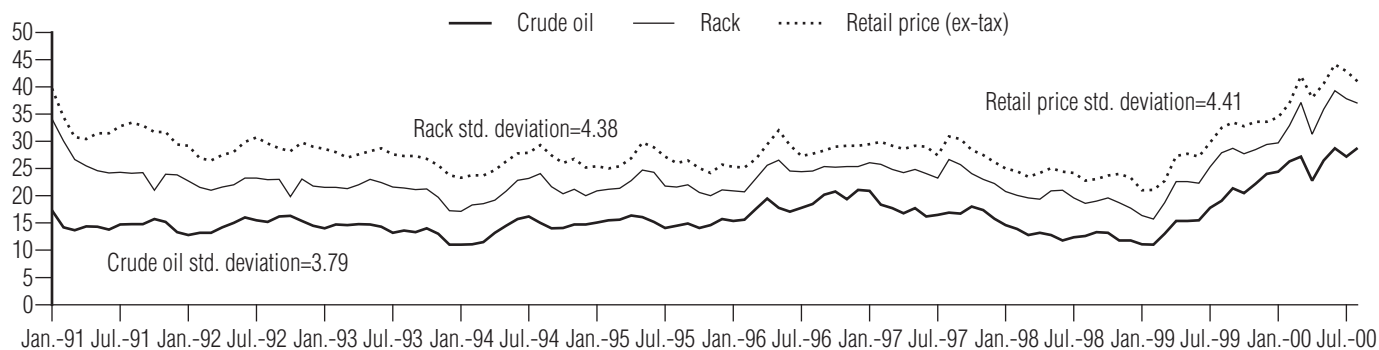
Source: The Conference Board of Canada.

Table 15
Results of the Cross-Subsidization Analysis
(Second Equation)

Variable	Estimated coefficient
Constant (α)	1.852 6.064
Crude oil ($CRUDE$)	-0.004 -2.477
Retail margin ($MR(-1)$)	0.794 46.787
Adjusted R2	0.650
Durbin-Watson	2.166

Source: The Conference Board of Canada.

Chart 59
Average Price of Crude Oil, Rack and Retail (Ex-tax) Gasoline
(cents per litre)



Sources: M.J. Ervin.

Many important studies have been carried out on the Canadian petroleum industry and on specific issues related to gasoline pricing in Canada and abroad. We have used these studies as a background to the current report and have examined their findings and methodological approach in order to build on their work. Summaries of these studies are found in this appendix.

The appendix is divided into four sections: Canadian Studies, American Studies, Asymmetry Studies and Studies on Below-Cost Sales Legislation.

Canadian Studies

Canadian Retail Petroleum Markets Study
M.J. Ervin (1998)

The study by Ervin gives a comprehensive overview of the downstream petroleum industry in Canada. The study also includes an analysis of 19 markets across Canada. These market studies compare different regions and key indicators.

Ervin starts by developing a Pump Price/Margin Model to illustrate the relationships between the price components for a litre of gasoline. For 1996, the average price was 56.8 cents. The components were the price of crude oil (19.1 c.p.l.), the refiner margin (5.3 c.p.l.), the freight cost (0.3 c.p.l.), the retail margin (3.5 c.p.l.) and taxes (28.6 c.p.l.). The retail margin of 3.5 c.p.l. must cover outlet costs, dealer income, supplier cost and profitability at the retail level. Using this model, Ervin shows that price competition occurs at three levels: crude oil, rack and retail. The prices for these products are determined in a competitive marketplace, and the margins reflect supply and demand factors.

Ervin then looks at the structure of the petroleum industry. In 1995, approximately 16,000

outlets were operating across the country, compared to 22,000 in 1989. Over half of these stations operated as lessees or independents, meaning that the price was determined at the retail level. Over the years, ancillary revenues, such as convenience stores and car washes, became an important factor because they gave retailers another source of revenue. Due to this new revenue, it was possible for retailers to lower their margins and offer a cheaper product.

The author then examines the historical trends in gasoline prices. He observes, from 1986 to 1995, that the ex-tax pump price declined by 4 c.p.l. while the "tax-included" price increased. From 1991 to 1996, the average tax content rose 5 c.p.l. across the country. Since 1991, refiners and retailers have lowered their margins because of competition. This decline is a result of, or has resulted in, improved refinery efficiency, the rationalization of retail outlets and an emphasis on ancillary revenues.

In Ervin's analysis of the 19 markets representing different regions across Canada, he found the presence of competition in all the markets. He explained the difference in the pump price between larger and smaller centres as the result of throughput. Larger centres have higher throughput per outlet, resulting in lower retail margins compared to smaller centres. An analysis of ancillary sales is also included in the market studies. Ervin finds that, on average in 1995, urban outlets experienced a net loss without ancillary revenues, and that the sale of gasoline alone did not cover operating costs.

With his findings, Ervin concludes that competition exists in the Canadian retail gasoline sector. He observes that the retail and refiner margins have experienced a downward trend over time and that lower margins are due to higher throughput. He also notes that margins are

small and that taxes are a significant factor in the price of gasoline. Finally, fluctuations in the pump price can be a reflection of competition in the marketplace.

Retail Gasoline Market Shares: An Analysis of the Experience of Integrated Companies and Independents over the Decade in Selected Canadian Cities

Loretta Mahoney (1999)

The study by Mahoney analyzes the market share trends of vertically integrated and non-integrated companies in the retail gasoline industry. The study covers a 10-year period from 1988 to 1998 and includes 12 Canadian cities: St. John's, Halifax, Saint John, Charlottetown, Quebec City, Montreal, Ottawa, Toronto, Winnipeg, Regina, Calgary and Vancouver. The study looks at the number of outlets, throughputs and market shares by the different types of retailers and also includes an analysis of the retail margin for the same time period.

Mahoney finds that all markets have different characteristics and that there is no uniform trend over the years. Both vertically integrated and non-integrated companies suffered many reversals over the decade. For example, independents' market shares varied considerably, ranging from nil in Halifax in 1988 to a high of 37 per cent for Winnipeg in 1992. All cities in the study, with the exception of Montreal, Toronto and Ottawa, have seen improvement in the market share of independent retailers.

In the early 1990s, the vertically integrated companies rationalized their service stations, with the four eastern cities experiencing the biggest impact as a result. Since then, the integrated companies have outperformed (measured by average throughput) the independent retailers, especially in the eastern cities.

The net change in the number of service stations occurs when people rebuild a service station, open a new one, rebrand an existing one or close a station. During their rationalization period, the integrated companies divested themselves of their poorest outlets, many of which were acquired by independents. Rebranding was also a significant activity. Only 4 per cent of changes in the number of service stations occurred because of rebuilding.

In the study, Mahoney also looks at the retail margin. The author observes that Quebec City, Montreal and Ottawa have suffered the biggest compression of the margin over the decade. For the western markets, margins have been relatively stable over the 10-year period, while in Vancouver, a price war that broke out in 1998 basically led to a margin of nil.

Wholesale and Retail Competition in the Canadian Petroleum Industry: An Econometric Analysis

Anindya Sen (1999)

In his study, Sen tests whether the presence of independents is associated with lower retail gasoline prices. His analysis is done over a seven-year period (1991 to 1998) and covers 12 Canadian cities (St. John's, Halifax, Saint John, Charlottetown, Montreal, Quebec City, Ottawa, Toronto, Winnipeg, Regina, Calgary and Vancouver). Sen pools the data to average out any random event that may be specific to a particular city or year.

In his analysis, Sen explains two relationships: the relationship between the retail price and the rack price, and the one between the rack price and the price of crude oil. The first model consists of a regression of the retail price on the rack price, average throughput per station, average income, population density, concentration indexes for the different types of retailers, and city and seasonal effects. The equation is given by:

$$R_{i,t} = C_i + \beta_1 W_{i,t} + \beta_2 AVGT_{i,t} + \beta_3 INC_{i,t} + \beta_4 PDENS_{i,t} + \beta_5 HERFM_{i,t} + \beta_6 HERFR_{i,t} + \beta_7 HERFI_{i,t}$$

where R is the retail price, W is the rack price, $AVGT$ is the average throughput per station, INC is the average income, $PDENS$ is the population density, $HERF$ is the Herfindahl index for the different types of retailers (M : major, R : regional and I : independent) and C is the constant, which is specific to the city (representing city factors). Dummy variables are included in the equation to capture seasonal effects.

The second model consists of a regression of the rack price on the price of crude oil, the number of wholesalers, the number of refineries, city factors and seasonal factors. The equation is given by:

$$W_{it} = C_i + \beta_1 CO_{it} + \beta_2 CO_{it-1} + \beta_3 CO_{it-2} + \beta_4 NWHOL_{it} + \beta_5 NREF_{it}$$

where W is the rack price, CO is the price of crude oil, $NWHOL$ is the number of wholesalers, $NREF$ is the number of refineries and C is the constant, which is specific to the city (representing city factors). Again, dummy variables are included to model the seasonal factors.

With his analysis, Sen finds a positive correlation between the market concentration indexes and the retail price of gasoline. From this result, he concludes that independents do not have a significant impact on retail prices. Also, he finds a positive correlation between the rack price and the retail price, but the coefficient is less than one. This result suggests that a price increase in wholesale gasoline is not completely passed on to consumers. Sen also concludes that the average throughput per station has a negative impact on the retail price. Finally, from his second model, Sen links crude oil prices to rack prices and observes that a one cent per litre increase is completely passed on to the wholesale price.

Evaluation of the Six Residents' Allegation of Price-Fixing in the Canadian Petroleum Industry

Dr. George Lerner (1996)

The Lerner study is a response to the allegation, made by six residents, of price fixing in the gasoline industry in April 1996. After analyzing in detail the relationship between retail and wholesale prices and crude oil prices and also refiner-marketer profitability, Lerner cannot confirm the presence of anti-competitive behaviour.

Lerner analyzes three major refiner-marketers' segmented downstream financial accounts. From this, he concludes that the increased profit levels were realized by reducing operating costs and expanding heating oil sales over the previous winter. The upward spike in retail gasoline prices—as well as in margins—during April 1996 was present in almost all Canadian urban centres, but is consistent with previous years.

The six residents who made the complaint also described the presence of an asymmetric response to the price of retail gasoline from a variation in crude oil cost. Lerner tests this hypothesis by first applying a symmetric model

to link the retail and wholesale prices to that of crude oil. He finds that the retail and wholesale prices respond very quickly to the price of crude oil in larger centres such as Toronto, Montreal and Vancouver. For smaller communities, such as Regina, Charlottetown, Saint John, St. John's and Halifax, the response takes more time. The author then tests an asymmetric response model and finds modest asymmetry, but the implication of the change is negligible. Lerner observes that the Canadian wholesale price very closely tracks that of the United States and concludes that refiners in Canada do not have significant influence on rack prices. Also, the decline of the retail margin over time demonstrates that there is no presence or undue influence of market power at the retail level.

The first model estimated by the author consists of a regression of the retail price on the one-period lag, the price of crude oil and a time trend. The regression equation is given by:

$$REGEXCITY_t = C + \beta_1 REGEXCITY_{t-1} + \beta_2 EDCPARWEDS_t + \beta_3 TREND_t$$

where $REGEXCITY$ is the ex-tax pump price of regular gasoline for a particular city, $EDCPARWEDS$ is the price of crude oil on Wednesdays in Edmonton, $TREND$ is a time trend and C is the constant. The estimation is done on a weekly basis for the following cities: Vancouver, Edmonton, Calgary, Regina, Winnipeg, Toronto, Ottawa, Montreal, Quebec City, Saint John, Charlottetown, Halifax and St. John's.

The second model consists of a regression of the rack price on the one-period lag, the price of crude oil and a time trend. The equation is given by:

$$RACKCITY_t = C + \beta_1 RACKCITY_{t-1} + \beta_2 EDCPAR_t + \beta_3 TREND_t$$

where $RACKCITY$ is the rack price for the particular city, $EDCPAR$ is the price of crude oil in Edmonton, $TREND$ is a time trend and C is the constant. The estimations are done on the same cities as the first model.

From these regressions, Lerner observes a downward trend in the retail and wholesale price of gasoline and notes the importance to consumers. Since there is no trend in the price of crude oil, this means that the

refiner-marketer margin has been declining over time. The decline in margins has been occurring since 1987 in urban markets and has forced the rationalization of refinery operations and the downsizing of service stations. Competing U.S. supply sources, service station over-capacity and excess refinery capacity has induced the rationalization. The downward trend in the retail margin was examined for Vancouver, Edmonton, Calgary, Winnipeg, Toronto, Ottawa, Montreal, Quebec City, Saint John, Charlottetown, Halifax and St. John's. Regina is the only exception.

Lerner concludes that Canadian wholesale gasoline prices closely track U.S. wholesale prices. He also finds that retail gasoline margins over the wholesale price are low because of refinery and service station over-capacity. Another conclusion is that the downward trend in the retail margin confirms that the gasoline industry is in transition. The industry will continue to rationalize the number of service stations until they reach a stable market equilibrium. When this equilibrium is reached, the downward trend will disappear.

Analysis and Opinion on Retail Gas Inquiry

Ken Hendricks (1996)

Hendricks' study is also a response to the six residents' allegation that the integrated oil companies were fixing prices. The goal of the study is to look into three issues:

- Measuring the response pattern and adjustment time for a variation in crude oil prices to be passed through to the wholesale and retail price of gasoline.
- Determining whether the response patterns are the same for an increase in crude oil prices as they are for a decrease.
- Comparing response patterns for different Canadian cities.

To look at these three issues, Hendricks uses two types of model: a model with a symmetric response pattern and one with the possibility of an asymmetric response pattern. Both models are based on the Borenstein, Cameron and Gilbert (1997) Error-Correction Model (cited below). The first model is:

$$\Delta R_t = \sum_{i=0}^m \beta_i \Delta C_{t-i} + \sum_{i=1}^m \theta_i \Delta R_{t-i} + \gamma (\epsilon_{t-s}),$$

where ΔR is the first difference in the retail price, ΔC is the first difference in the price of crude oil and ϵ_{t-s} is the error-correction term. The estimation was done using weekly data from April 2, 1991, to June 25, 1996. The cities included in the study are Calgary, Halifax, Montreal, Regina, Toronto and Vancouver.

Hendricks finds that an unanticipated change in the price of crude oil is completely passed through to the retail price in every city except Regina. The adjustment period varies between cities. For Montreal and Toronto, it takes approximately five to seven weeks for a variation in the price of crude oil to be passed through to the retail price. The other cities take longer for the adjustment.

The second model tests for asymmetry. The approach is the same as Borenstein, Cameron and Gilbert (1997). The model estimated is:

$$\Delta R_t = \sum_{i=0}^m (\beta_i^+ \Delta C_{t-i}^+ + \beta_i^- \Delta C_{t-i}^-) + \sum_{i=1}^m (\theta_i^+ \Delta R_{t-i}^+ + \theta_i^- \Delta R_{t-i}^-) + \gamma (\epsilon_{t-s}),$$

where ΔR is the first difference in the price of retail, ΔC is the first difference of cost and ϵ_{t-s} is the error-correction term. If the coefficients β^+ and β^- are equal, then the adjustment pattern is symmetric. If the coefficients β^+ and β^- are not equal, then the adjustment pattern is asymmetric. The author finds that response patterns are the same for an increase in crude oil prices as they are for a decrease. The possible exception is Vancouver, where the passthrough rate seems faster for an increase than for a decrease.

American Studies

Assessment of Summer 1997 Motor Gasoline Price Increase
Energy Information Administration (1998)

In the spring of 1997, retail gasoline prices increased as they usually do at the beginning of the driving season. But 1997 differed from the previous years. For example, at the same time the previous year, there was a sharp increase in the retail price, mainly due to an increase in the price of crude oil. After a year, crude oil prices fell and brought down the retail price along with them.

In August 1997, the price of retail gasoline rose by seven cents or more a gallon. There were many reasons behind the increase, notably an unexpected rise in demand in July. Refinery problems in the United States and abroad in late July and August restrained supply, and inventories plummeted to their lowest point since 1981. Because of the increase in supply and demand problems, the New York harbour spot price increased 20 c.p.l. in August compared to July. Retail prices soon followed and did not start to drop until Labour Day, which represents the end of the driving season.

In the report, the authors look at the supply and demand forces behind the 1997 summer increase in gasoline prices. They also analyze gasoline markets on the West Coast, production capacity within the United States, gasoline imports, the relationships between prices at different levels of the gasoline industry and the behaviour of the futures markets.

Price Changes in the Gasoline Market: Are Midwestern Gasoline Prices Downward Sticky?

Energy Information Administration (EIA)(1999)

The authors look at what is sometimes referred to as “downward sticky prices.” Using weekly data from October 1992 through June 1998, their report looks at price asymmetry in the Midwest of the United States.

Using EIA data, the authors show that retail gasoline prices appear asymmetric. Their examination of price asymmetry considers the speed and degree of adjustment of the retail gasoline price to a variation in the prices of wholesale gasoline and crude oil, and the wholesale price to the crude oil price. The report discusses two types of asymmetry: amount asymmetry and pattern asymmetry. Amount asymmetry is the magnitude of change in the retail price occurring from a variation in wholesale or crude oil prices. Pattern asymmetry treats the rate of adjustment occurring from a variation in cost.

The authors show that wholesale and retail prices in the Midwest have a symmetric response to a variation in crude oil. They also found that retail gasoline prices often rise faster than they fall when a variation in the wholesale price occurs. They conclude that pattern asymmetry is present, but that amount asymmetry is not. The

reason is that the pass-through seems to be complete whether it is for an increase or a decrease in the wholesale price. They mention that the pattern asymmetry might be only a statistical artifact because retail prices continue to rise even after a decline in the wholesale price of gasoline.

Asymmetry Studies

The section reviews the literature that looks at asymmetric response in price to variation in costs. There is an English study by Bacon (1991) and a German one by Kirchgässner and Kübler (1992). Karrenbrock (1991); Duffy-Deno (1996); Borenstein, Cameron and Gilbert (1997); and Godby, Lintner, Stengos and Wandschneider (2000) look at the United States. The study by Hendricks (cited previously) also deals with asymmetry.

Rockets and Feathers: The Asymmetric Speed of Adjustment of U.K. Retail Gasoline Prices to Cost Change

Bacon (1991)

Bacon studied the retail gasoline market for London, England. The wholesale market located in Rotterdam was supplying the retailers. The study uses biweekly data from June 15, 1982, to January 19, 1990. To test for an asymmetric response pattern, Bacon uses the following Quadratic Partial Adjustment Model:

$$R_t = R_{t-1} + \beta(a + b(t) + C_{t-1} - R_{t-1}) + \alpha(a + b(t) + C_{t-1} - R_{t-1})^2,$$

where R is the price of retail gasoline, C the price of crude oil and t is a time trend. If the coefficient a is equal to zero, then the response pattern for the retail price is symmetric. If the coefficient is above zero, the retail price adjusts more quickly to an increase in cost. If the coefficient is below zero, the retail price adjusts more quickly to a decrease in cost. Bacon finds that the coefficient a is above zero, thus concluding that an asymmetric response pattern exists in London, England.

Symmetric or Asymmetric Price Adjustments in the Oil Market: An Empirical Analysis of the Relations Between International and Domestic Prices in the Federal Republic of Germany, 1972–89

Kirchgässner and Kübler (1992)

Kirchgässner and Kübler test for asymmetry using an error-correction model. They analyze the relationship between retail and wholesale prices for Germany. They use monthly data and test for two sub-periods: the 1970s and the 1980s. They find that the retail price responds faster to a decrease in the price of wholesale rather than an increase for the 1970s. They also find a symmetric adjustment pattern for the 1980s.

The Behavior of Retail Gasoline Prices: Symmetric or Not?
Karrenbrock (1991)

Karrenbrock looks at the U.S. market for the 1980s. He tests for price asymmetry between the retail and wholesale levels using monthly data. The model he uses is similar to that used by Borenstein, Cameron and Gilbert, except that he does not include an error-correction term. Karrenbrock concludes that an asymmetric adjustment pattern exists between the price of retail and wholesale gasoline. The retail price responds faster to an increase in the wholesale price than to a decrease.

Retail Price Asymmetries in Local Gasoline Markets
Duffy-Deno (1996)

Duffy-Deno studied the retail gasoline market for Salt Lake City from 1989 to 1993. Using a model similar to that used by Karrenbrock, he tests for the presence of asymmetry with weekly data. He finds that retail prices respond faster to an increase in the price of wholesale than to a decrease.

Do Gasoline Prices Respond Asymmetrically to Crude Oil Price Changes?
Borenstein, Cameron and Gilbert (1997)

Borenstein, Cameron and Gilbert test for price asymmetry at three different levels: between retail and crude, retail and wholesale, and wholesale and crude. Their study consists of monthly data ranging from 1986 to 1992 for the eastern United States. For their estimation, they use an Error-Correction Model:

$$\Delta R_t = \sum_{i=0}^n (\beta_i^+ \Delta C_{t-i}^+ + \beta_i^- \Delta C_{t-i}^-) + \sum_{i=1}^n (\gamma_i^+ \Delta R_{t-i}^+ + \gamma_i^- \Delta R_{t-i}^-) + \theta_1 (R_{t-1} + \varphi_0 - \varphi_1 C_{t-1}),$$

where ΔR is the first difference in the price, ΔC is the first difference of cost and $(R - \varphi_0 - \varphi_1 C)$ is the error-correction term. If the coefficients β^+ and β^- are equal, then the adjustment pattern is symmetric. If the coefficients β^+ and β^- are not equal, then the adjustment pattern is asymmetric. The authors find the presence of asymmetry at all three levels, with the relationship between wholesale and crude oil being the most important.

Testing for Asymmetric Pricing in the Canadian Retail Gasoline Market
Godby, Lintner, Stengos and Wandschneider (2000)

Godby, Lintner, Stengos and Wandschneider consider a different approach to testing for an asymmetric response pattern. Using weekly data, they test for asymmetry between retail prices and crude oil prices for the period from 1990 to 1996. They estimate a threshold model. The level of the threshold can be estimated instead of imposing it equal to zero. The following equations are estimated:

$$\Delta R_{t,i} = \alpha_0 + \alpha_1 Z_{t-1,i} + \sum_{k=0}^n (\beta_k \Delta C_{t-k,i}), q_i < \phi$$

$$\Delta R_{t,i} = \alpha_0 + \alpha_1 Z_{t-1,i} + \sum_{k=0}^n (\beta_k \Delta C_{t-k,i}), q_i \geq \phi,$$

where i indicates the city, t the time and Z is an error-correction term. Several variables for the threshold were used. An example is $q_i = \Delta C$ and ϕ might not be equal to zero, which is imposed by the other studies. If the estimated coefficients are equal in both equations, then the adjustment pattern is symmetric, otherwise it is asymmetric. The authors did not find the presence of an asymmetric response pattern.

Studies on Below-Cost Sales Legislation

Predatory Pricing and State Below-Cost Sales Statutes in the United States: An Analysis
Terry Calvani (1999)

Calvani analyses the U.S. treatment of predatory pricing, including below-cost sales laws, with particular attention to gasoline markets. Calvani concludes that consumers pay higher prices in markets with gasoline below-cost

sales laws. The author also shows that independent retailers are not better off.

The Impact of Sales-Below-Cost Laws on the U.S. Retail Gasoline Market

Ronald N. Johnson (1999)

Johnson's study examines whether Sales-Below-Cost laws have significantly altered the number and structure of

retail gasoline outlets in states that have adopted these laws. Johnson's empirical analysis indicates that neither general nor motor-fuel Sales-Below-Cost laws have had a large and significant impact on the number or composition of the retail gasoline outlets. His results also show that divorcement and bans on self-service have not stemmed the decline in, nor composition of, retail outlets.

List of Stakeholders Consulted

APPENDIX D

Organizations

5th Wheel Truck Stops—John Dunstill

Alimentation Couche-Tard Inc.—Stéphane Maher, Directeur des opérations pétrolières

Association Québécoise des Indépendants du Pétrole (AQUIP)—René Blouin, Président-directeur général; Sonia Marcotte, Directrice des Affaires économiques et juridiques

Canadian Automobile Association (National)—Elly Meister, V.P., Public Affairs and Communications

Canadian Automobile Association (Quebec)—Claire Roy, Director, Public Affairs

Canadian Consumers Association—Dr. Peter Dyne, Michel Bourassa

Canadian Federation of Independent Business (Atlantic Canada)—Peter O'Brien, responsible for Atlantic Canada

Canadian Federation of Independent Business (Quebec)—Sylvie Ratté, Pierre Cléroux

Canadian Petroleum Products Institute (CPPI)—Alain Perez, William Simpkins, Bob Clapp, Ron Harper, Jack Belletrutti

Canadian Tire Corporation Ltd.—Eymbert Vaandering, Vice-President, Petroleum

CANGO Inc.—David Armstrong, President

Chevron—Bob Innes

Consumer Group for Fair Gasoline Prices—Dennis O'Keefe

Domo Gasoline Corporation Ltd.—Bruce Chwantacky

Federated Co-op Fuels Ltd.—Al Robinson, Senior Vice-President, Corporate Affairs

Gra-Ham Energy—Rick Hammond

Husky—Chulk Sardow

Imperial Oil—Jim Hughes, Manager, Corporate Planning Dept., Energy Analysis; Margaret Kelsch, Marketing Services Manager, Automotive Division

Independent Retail Gasoline Marketers Association of Canada (IRGMA)—Manju Sekri, Executive V.P., Michael Budd, Donald Green

Irving Oil Limited—Kyle Logan

MacEwen Petroleum Inc.—Allan MacEwen, President

Mr. Gas—André Gagnon, Director

NORCAN—Gary Garson

Nova Scotia Retail Gasoline Dealers Association—Graham Conrad

Ontario Fuel Dealers Association—Randy Turner, President

Options Consommateurs—Yannick Vennes

Parkland Industries—Jack Donald, President and CEO; Jim Jones, Vice President, Marketing, Fas Gas Oil Ltd.; Bradley Williams, Manager, Race Track Fuels Ltd.; John Schroeder, Vice President, Finance

PEI Petroleum Marketers Association—Mike Hennessey, President; Howard Bowie

Petro-Canada—Steven Keith, Manager, Pricing Relations; Tom Lawson, National Pricing Manager; Donna Hildebrant, Manager, Communications Downstream; Michel Roy, Manager, Engineering Services, Montreal Refinery

Pétroles Crevier Inc.—Pierre Crevier, Président

Pétroles Therrien Inc.—Serge Therrien, Directeur général

Pioneer Petroleum—Tim Hogarth, Jack Theriault

Robbins Fuels—Colin Robbins, President

Shell Canada—Paul Lapensée, Vice-President, Quebec and Atlantic Markets

Sunoco—Kathy Crooks, Director, Fuel Sales

Ultramar—Louis Forget

United Petroleum Products—Chuck Husel, President

Wilson's Fuel—Dave Collins

Individuals

Glenn Bradbury, Legislative Assistance to Dan McTeague

Dan McTeague, M.P., Pickering–Ajax–Uxbridge

Barry Bower, Ministry of Energy, Science and Technology, The Government of Ontario

Spencer Knipping, Ministry of Energy, Science and Technology, The Government of Ontario

Barry Lynch, National Energy Board

Jean-Thomas Bernard, Professor, Laval University

Joseph Doucet, Professor, Laval University

Mondher BenHassine, Senior Analyst, Oil Transportation, Energy Resources Branch, Natural Resources Canada

Doug Rollins, Former service station owner

Giorgio Grappolini, Refinery Specialist, Industry Canada

The research team also appreciates the input of numerous service station operators and employees as well as Canadian consumers who spoke of their experiences with the gasoline industry.

The input of all of the above was instrumental in completing this report.



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