How Gasoline Gets Its Price

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In December 1998, there was a glut of crude oil, which resulted in its price dropping below $11 a barrel, the lowest it had been since 1986. The Organization of Petroleum Exporting Countries (Saudi Arabia, Iran, Kuwait, the United Arab Emirates, Venezuela, Qatar, Iraq, Algeria, Libya, Nigeria and Indonesia) and some non-OPEC oil-producing countries decided something had to be done to raise the price, and called for a reduction in the amount of oil they produced. At the same time, there was an increase in the demand for oil, stemming from economic recovery in almost all Asian countries (Japan being the exception), coupled with resurgence in economic growth in Europe and Latin America and no deceleration of the robust U.S. economy. The result was a reduction of oil inventories. Shrinking supply and increasing demand lead to higher prices, and thus it was not long before the world was faced with the highest crude oil prices it had seen in 10 years.

The rise in crude oil prices has led to significantly higher prices for gasoline and other products made from crude oil around the world. The situation was rendered more acute by a trend that Alan Greenspan, chairman of the Federal Reserve Board, noted in a speech last October in Washington, D.C. "Over the years," he said, "innovation and consolidation have significantly reduced the operating inventories of crude oil and products required to service a given level of product demand." What this has meant is that there are fewer reserves to draw on than in the past when there are increases in demand or reductions in supply. As with "just-in-time" production in manufacturing (which calls for supplies to be acquired as needed rather than stored), this approach results in lower inventory carrying costs. However, when supply is disrupted, the impact on product availability and price can be significant, as we witnessed in 2000, when oil prices peaked at about $36 (U.S.) a barrel. As the price of oil rose, so too did the price of products made from it.

No other price is as visible as that of regular unleaded gasoline. We don't even have to drive into the service station to see the price; it can be seen from the street half a block away. Why? Because price, along with location, is the key factor in determining where a consumer will buy gasoline. So, if gasoline retailers want customers, they have to display prices prominently.

The price of gasoline changes often, a fact that draws considerable media attention. This attention, combined with the visibility of prices, has meant that consumers are much more aware of fluctuations in the price of gasoline than in the price of most other products.

And so they ask the inevitable question: why do gasoline prices fluctuate so much? To answer this, one must look at how gasoline prices are determined, which in turn necessitates an understanding of the various factors that influence the price of gasoline at the pump. These include the price of crude oil; the wholesale refining market, which determines the "rack" (or wholesale) price; and the retail sector, where local competition and taxes play a role.

Crude oil is an international commodity that's priced in U.S. dollars and whose selling price, on a transportation- and quality-adjusted basis, is similar in almost all parts of the world. As is the case with most other products, the price of crude oil is essentially driven by supply and demand. In the short term (ignoring OPEC for the moment), both supply and demand for crude oil are price insensitive, or to use an economic term, price inelastic. With respect to supply, new sources of crude oil cannot be developed overnight – drilling and building pipelines takes time. By the same token, on the demand side, ultimate users of crude oil, such as motorists, do not rapidly exchange their vehicles for ones that get better gas mileage or alter their driving habits very quickly. It takes, for example, a large rise in gasoline prices for them to even partially abandon their cars for public transportation. With such insensitivity to price changes, even relatively small demand and supply shocks lead to large price changes. Turning to the recent crude oil price increases, both

demand and supply shocks occurred. As indicated earlier, world economic activity increased demand at a time when OPEC cut oil supplies.

Although OPEC today accounts for only about 40 percent of the world's crude oil supply (down from 50 percent 30 years ago), it is still a force to be reckoned with.

Under intense pressure from the western industrialized countries, particularly the United States, and armed with the knowledge that stratospheric crude oil prices lead to inflation and ultimately world recession, OPEC has now set a price target of between $22 and $28 (U.S.) a barrel for its basket of seven different crude oils. (Given that this basket includes some less desirable crude oils, it is priced lower than widely quoted light crudes such as West Texas Intermediate and North Sea Brent.) If the price of the basket stays above $28 (U.S.) a barrel or falls below $22 (U.S.), OPEC considers increasing or decreasing its output. In keeping with this strategy, OPEC expanded production four times last year by a total of about 3.7 million barrels a day.

Also contributing to the steep rise in oil prices last year were worries that a harsh winter in the United States would strain heating oil supplies. In addition, United Nations-imposed sanctions on Iraq have reduced its output. Finally, tensions between Israelis and Palestinians made Middle East oil supplies in general insecure.

Of course, it is not the first time that events in the Middle East, where most OPEC members are located, have had a significant impact on oil prices. The 1973 Yom Kippur War started a crisis during which oil prices (adjusted for inflation) hit about $45 (U.S.) a barrel. During the Iranian Revolution in 1979, they climbed to about $90 (U.S.) a barrel. And during the 1991 Gulf War, they reached about $50 (U.S.) a barrel. The fact is that violence in the Middle East, or even the threat of it, puts into doubt the security of substantial crude oil supplies and hence causes prices to rise, at least temporarily.

In response to the rapid decline in U.S. economic growth during the last quarter of 2000 and with spring on the horizon in the Northern Hemisphere, OPEC announced a 1.5 million-barrel-per-day (5.6 percent) cut in crude oil production, effective February 1. Without a decrease in its production, the 10 members of OPEC, excluding Iraq, feared that prices would fall well below the $22 to $28 (U.S.) band for the OPEC basket of crude oils. Hawkish members of OPEC wanted an even greater cut, but were persuaded by Saudi Arabia, which accounts for about a third of OPEC production, to take a more wait-and-see approach. Also on OPEC's radar screen was the likelihood that Iraq would resume exporting oil at the level permitted by the United Nations (about two million barrels a day, rather than the 500,000 barrels a day that it was shipping at the end of 2000 as a result of a pricing dispute with the United Nations). Prior to the announcement that OPEC would cut production on February 1, the price had fallen to below $26 (U.S.) a barrel for West Texas Intermediate, before rising to nearly $32 (U.S.) a barrel after the cut was announced. OPEC ministers will meet again in mid-March, at which time it is likely that they will decide to cut production further.

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As long as crude oil prices do not rise above the proposed OPEC band for a prolonged period, inflation in Canada should be benign. As of December, the core consumer price index, which excludes food and energy, was rising at an annual rate of 1.9 percent, while the overall consumer price index was rising at a rate of 3.2 percent, the result, in large measure, of higher oil prices. Interestingly, oil prices have a smaller impact on Canadian inflation today than they did during the oil crisis of the 1970s. This is largely a result of the transformation of the industrial economy to one that is based more on services and information technology and the fact that oil is therefore less important in generating each dollar of the gross national product. In addition, increases in productivity (i.e., output per person) in the last few years have been relatively high, thus dampening the need for price

increases. Free trade has also played a role by providing a more competitive climate and, consequently, lower prices.

Canada produces 2.3 million barrels of crude oil a day, primarily from the western provinces, of which 1.3 million barrels a day are exported to the United States. (Saudi Arabia is the United States' major supplier, with Canada and Mexico alternating in second place.) But while Canada exports a significant amount of oil, it also imports oil – about 800,000 barrels a day, largely to Eastern Canada, from a variety of places, including the North Sea, Venezuela and Saudi Arabia. About 1.6 million barrels of oil are consumed in Canada each day, while 200,000 barrels a day is refined and then exported.

A consequence of higher oil prices here in Canada is an increase in oil exploration, which should lead to greater exports. Given that oil prices are quoted in U.S. dollars, the prospect of greater exports makes exploration particularly attractive at the moment.

The fact remains, however, that despite producing a substantial amount of oil, this country is not one of the world's major oil producers and therefore has little or no influence over the world price of oil. Canada is what economists call a "price taker." In other words, it must accept prices set on the world market whether they are low or high. As a result, if Canadian refiners are unwilling or unable to pay these prices, they can buy neither foreign nor domestically produced oil, which, like all crude, sells at world oil prices.

In Canada, there are 19 oil refineries, operated by 11 different petroleum companies. In the West, most refineries use domestically produced crude oil, and Central and Eastern Canadian refineries use a combination of domestic and imported crude. Why do refineries in Central and Eastern Canada import crude oil? Sometimes, it is because refineries are equipped to refine certain types of crude oil and those types may only be available from offshore sources. Also, it is often more efficient and economical for oil producers in the West to export oil to the United States Midwest than to send it east, and for central Canadian refiners to import oil that is delivered to East Coast depots from offshore sources.

In Western Canada, the price of Edmonton Par, a high-quality, light crude oil, serves as the benchmark for all varieties of crude oil produced in the region – other crude oils are priced a certain amount higher or lower than Edmonton Par, depending on their comparative quality. In turn, the price of Edmonton Par is based on the price at which West Texas Intermediate is sold in Chicago, since this is the area of the United States where the price of exported Canadian crude oil must compete. In Eastern Canada, oil prices are based on crude oil from the North Atlantic, namely North Sea Brent.

Crude oil is refined into a variety of products, including gasoline, diesel fuel, heating oil, jet fuels and asphalt; it stands to reason therefore that the prices of these products will be determined to a significant degree by the price of crude oil. But crude oil isn't the only determining factor. Weather, for example, plays a role in determining price. A severe winter can deplete heating oil inventories, causing the price to rise. Low gasoline inventories going into the heavy demand period for gasoline in the United States this past summer led to maximum quantities of gasoline and minimum quantities of heating oil being manufactured, resulting in heating oil inventories in the northeastern states that were 40 percent less than in 1999. This put pressure on heating oil prices and caused crude oil supplies to be diverted from gasoline production.

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The rack price of gasoline – in other words, the basic wholesale price of gasoline that is bought either on a spot or term (contract) basis from distribution terminals – is driven by what is happening in large product trading areas such as New York Harbor and the U.S. Gulf Coast. Like motorists, wholesale-gasoline buyers are very price sensitive when choosing where they

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make purchases and will tend to switch suppliers to take advantage of lower prices, with the result that rack prices are generally uniform in a given area in order to be competitive. These prices may differ from one area to another, but the difference generally reflects only transportation costs. Rack prices are published, or posted, publicly, although refiners will frequently sell gasoline at an undisclosed discount to those buying large quantities. In the end, however, wholesale buyers will not pay any more than they would for the alternative – imported product.

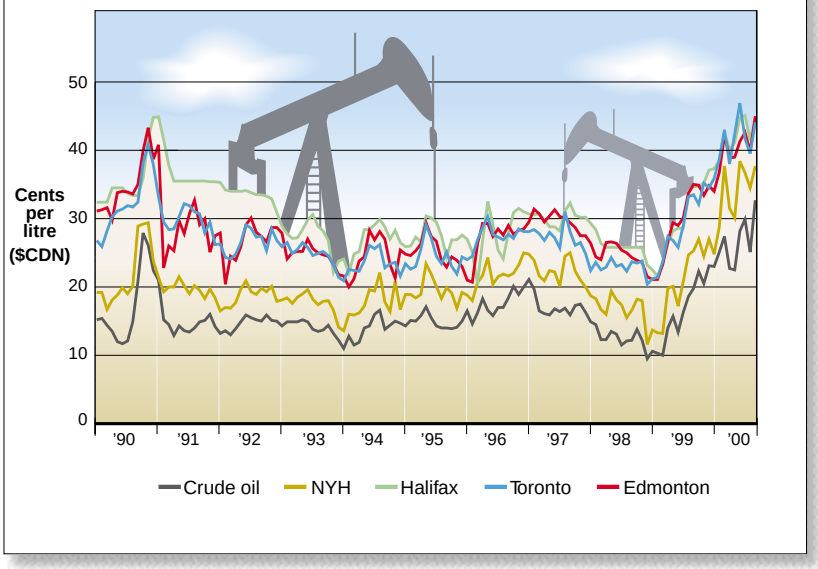
In most regions of Canada, the three national integrated producers of gasoline (the "majors," which include Imperial Oil, Petro-Canada and Shell), as well as at least one large regional producer such as Irving in the Maritimes, Ultramar in Quebec, Sunoco in Ontario and Chevron in British Columbia, operate retail outlets. In addition, there are the "independents," smaller companies that have retail outlets but do not produce gasoline. All told, there are about 13,500 retail gasoline outlets, or service stations, in Canada today, 8,500 fewer than in 1989. The result of this reduction is that the average amount of gasoline sold at each outlet (the "throughput") has risen enormously, and there is greater overall cost efficiency.

More than half of the retail outlets in this country are leased to their operators by the majors or are owned and operated by independents. On the whole, the independents tend to be located in smaller markets and set their own prices. In urban centres, most gasoline stations selling major brands are company owned – most are operated by agents with the companies setting prices.

What is interesting is that today, more and more service stations are providing ancillary services such as convenience stores and car washes, which, in fact, provide a much greater profit margin than the selling of gasoline. Despite public perception, when integrated oil companies report much higher profits, as they do during periods of high crude oil prices, these additional profits tend to result from the production of crude oil, not from increased refinery or retail margins. In fact, the refining and marketing entities of these integrated companies have published earnings generally between 0.5 and 1.5 cents per litre.

Local gasoline markets lacking a retailer with a dominant market share are the most price competitive. Gasoline prices tend to be highest in places to which it costs a lot to transport gasoline or where the throughput is relatively low. These are often smaller centres in rural areas where higher margins are necessary to make up for lower sales volumes.

Crude oil, New York Harbor and retail gasoline prices (taxes excluded)



The rack price of gasoline is driven by what is happening in large product trading areas such as New York Harbor and the U.S. Gulf Coast

Price cycles tend to be a way of life in most urban centres in Canada. Gasoline prices slowly fall and then abruptly take a leap – jumps of four or five cents a litre are not uncommon. Why are there price cycles? There are substantial economies of scale to be realized by increasing market share – the pumps exist and more customers can generally be handled without additional staff (the added customers may also splurge on a car wash or some goodies from the convenience store). The way to attract price-conscious gasoline customers is to lower prices. Of course, the competing outlet on the opposite corner or down the road doesn't want to lose customers, or market share, so it lowers its price to match that of its competitor. This lowering and matching of prices continues until profits are badly compromised – losses may even be incurred. Then one of the majors raises its price and the others follow suit with great relief. Sooner or later, a retailer will drop the price and so starts another cycle.

In short, the retail gasoline market in much of Canada is one in which all players in a given market move their prices in virtual unison. Except for the brief period when price changes are initiated, gasoline prices are almost identical in a given area. What does this imply about competition in the marketplace? As every elementary economics student is taught, one market for a given product means one price, whether that market consists of many sellers or a

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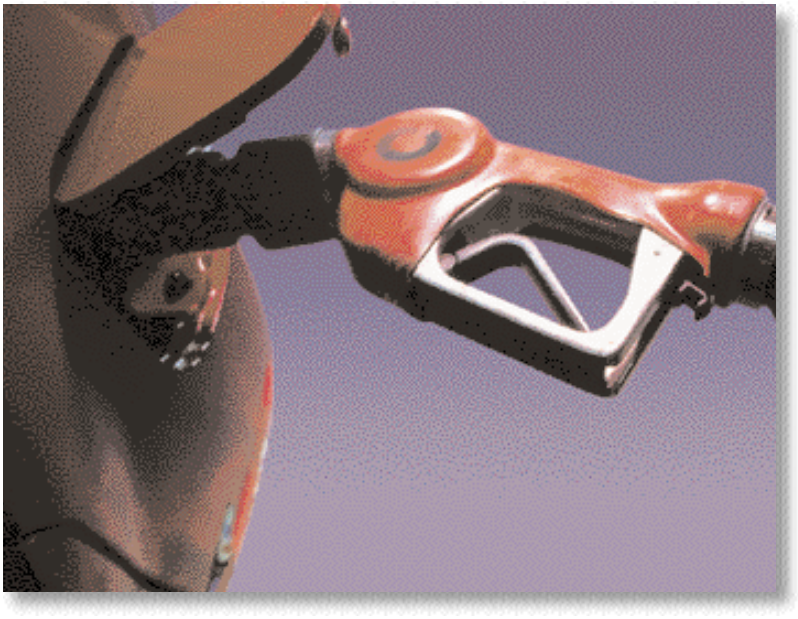
few, and whether any one seller can affect the price or not.

Retail gasoline markets may become even more competitive as a result of the growing presence of chains of extremely high-volume retail gas bars at huge supermarkets and discount stores (such as Costco and, in the West, Safeway). Whether these chains can become sufficiently profitable to be a serious force in Canada is unclear, but in the United States, France and Britain, where they are already well established, they are proving very successful.

Over the years, the federal Competition Bureau has carried out investigations of the gasoline industry in response to public concerns that competition was being thwarted. In early 2000, the bureau reported on three investigations following claims of artificially high gas prices in 1999. These investigations completely exonerated the industry of anticompetitive behaviour. Two concerned local markets, Kenora, Ont., and Conception Bay South, Nfld., and the third related to countrywide gasoline-price increases that occurred in July 1999. With regard to the Conception Bay case, the bureau stated: "...there is no evidence to support allegations of price fixing, abuse of dominance, price maintenance or conspiracy by gasoline suppliers in Conception Bay." This also reflected the findings regarding the Kenora case. The bureau's 1999 price rise investigation concluded: "...the price increases were due to increases in the price of crude oil.... The evidence indicates that the gasoline companies made independent decisions.... There is no evidence to suggest that gasoline companies communicated or co-operated with one another when implementing price increases. The July 1999 price increases, while dramatic, were the result of normal market forces." In a new study sponsored by the federal government, "The Final Five Feet of Hose: The Canadian Gasoline Industry in the Year 2000," the Conference Board of Canada comes to similar conclusions.



Consumers are much more aware of fluctuations in the price of gasoline than in the price of most other products

Interestingly, since 1994, using prevailing exchange rates, Canadians have paid slightly less for their gasoline (excluding taxes) than U.S. motorists in border states. *Fuel Facts*, a bimonthly publication that monitors changes in fuel prices, examined retail gasoline prices in 10 cities in Canada and five in the United States for the four weeks ending on January 23, 2001, and found that the average Canadian price for regular gasoline (without pump taxes) was 39.2 cents a litre compared with a U.S. average of 45.7 cents a litre (the average for the 12 months ending with January 2001, according to *Fuel Facts*, was 45.64 cents a litre in the United States versus 41.53 in Canada). Among the reasons given for this was a dramatic drop in the combined gross refining and marketing margins on the Canadian side of the border, resulting from increased throughputs at some retail outlets, a consequence of the closure of other small and inefficient outlets and the growth of profitable ancillary services, such as convenience stores. Another reason was the introduction of new reformulated gasoline standards in the United States, which raised U.S. refining costs and, consequently, pump price.

The average final pump price is significantly higher in Canada than in the United States: 69.4 cents a litre compared with 62.5, according to *Fuel Facts*. The difference is the result of tax, which averages 30.2 cents a litre in Canada in contrast with only 16.8 cents a litre in the United States. (Canadian taxes and crude costs in 2000 constituted, on average, more than 80 percent of the pump price.)

Canadian taxes vary from province to province. As well, municipal taxes are sometimes applied (municipal tax in Montreal, for example, is 1.5 cents a litre, and in Vancouver four cents a litre). The federal excise tax on gasoline is 10 cents a litre (up from 8.5 cents a litre in 1995); provincial excise tax ranges from nine cents a litre in Alberta to 16.5 cents a litre in Newfoundland. Both Canadian federal and provincial excise taxes are applied per litre, rather than on a percentage basis, and therefore

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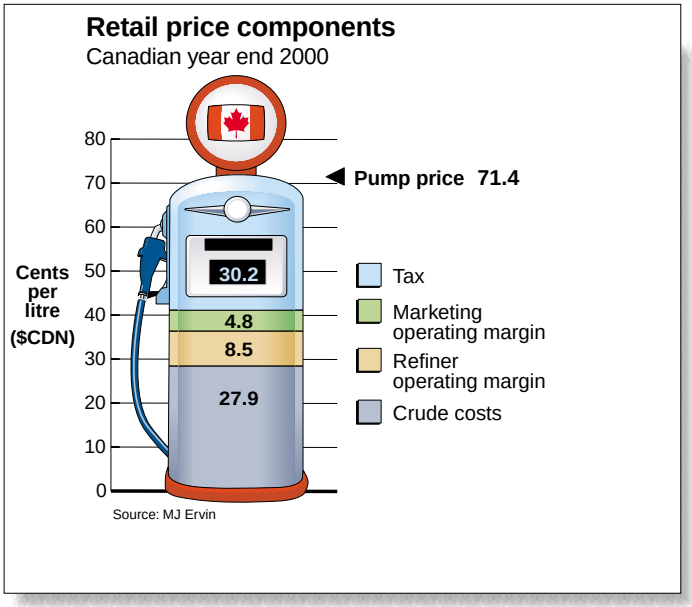
do not increase – or decrease – with the pretax price. In addition to fixed taxes, there is GST (federal government sales tax) of seven percent, which is an ad valorem, or percentage, tax and so increases in absolute terms when prices increase. In Quebec, provincial sales tax is levied on the GST as well, making for a combined GST and PST of 15.025 percent. And in Newfoundland, Nova Scotia and New Brunswick, where GST is combined with the provincial sales tax, there is an overall rate of 15 percent. Clearly, taxes account for much of the interprovincial differences in retail gasoline prices; they are also a key reason why pump prices in Canada are higher than in the United States. That being said, taxes in Canada are not as high as in much of the rest of the industrialized world. For example, they are only about a third of those prevailing in major Western European countries.

Last year's oil price increases, which seemed particularly high when contrasted with the abnormally low price of 1998 and early 1999, sparked heated protests in Europe and milder outcries in North America during late 2000, with some governments providing tax relief. In Canada, truckers protested, but not to the extent of their European counterparts, perhaps because fuel prices are so much lower here than in Europe. In Canada, only the Alberta government has cut fuel taxes, although other relief in the form of cuts to capital gains and income tax has been implemented.



In the long term, what steps should be taken to provide energy at reasonable prices? Conservation of fossil fuels and exploration for new sources of oil are a priority – prices of oil and gasoline must be high enough to encourage consumers to conserve energy supplies and to make exploration for new sources of oil worthwhile.

What is not a sensible policy is regulating gasoline prices. Perhaps regulations would lead to fewer fluctuations in price, but this would be detrimental to consumers, since, most likely, gasoline retailers would not reduce the price of gasoline if they could not raise the price again at a later time without appealing to a regulating body. Regulations would also require enforcement, which would be costly. At the moment, only Prince Edward Island regulates pump prices, and there is no evidence that, over time, prices are lower in that market or that the retail sector is more efficient than in areas where prices are not regulated. However, when the price of crude oil drops, prices will remain higher in Prince Edward Island than in the rest of the country, where the drop will be felt more quickly. It will be the reverse when the price increases. Regulation smooths price levels, but at a cost.

Even with the relatively high prices at the pump in recent months, it is important to remember that Canadians are able to buy gasoline more cheaply than consumers in most industrialized countries – the United States, as a result of lower fuel taxes, being the only notable exception. At the retail level, competition seems to be fulfilling its role. And while successive investigations have vindicated the oil industry, the watchful eye of the Competition Bureau is a good insurance policy, as it is for any industry where four or five firms claim a large market share.

Canadian taxes and crude oil costs in 2000 constituted, on average, more than 80 percent of the pump price

The way gasoline prices evolve is unlikely to change very much in the next few years, although new competition may be forthcoming from the high-volume gas bars associated with so-called "big box retailers." The new competition will require further innovations and increased efficiency on the part of the established players. With respect to the particular retail price of gasoline, a fully reliable crystal ball is not available. In the longer term, the price of crude oil is likely to remain for the most part within the OPEC target range of $22 to $28 (U.S.) a barrel. (That likelihood was reflected in the futures market in January, where prices for more distant delivery of crude oil are substantially below spot prices.) With more time, non-OPEC producers are likely to bring new supplies on stream and the world economy will probably learn to function with less oil per dollar of gross national product, both of which should put downward pressure on gasoline prices. ❐

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