CT 89/3

Expropriation

THE COMPETITION TRIBUNAL

IN THE MATTER OF an Application by the Director of Investigation and Research under sections 92 and 105 of the Competition Act, R.S.C. 1985, c.C-34, as amended;

AND IN THE MATTER OF the acquisition by Imperial Oil Limited of the shares of Texaco Canada Inc.

COMPETITION TRIBUNAL
TRIBUNAL DE LA CONCURRENCE
FILED / DÉPOSÉ
JULY 21 1989
REGISTRAR - REGISTRAIRE
OTTAWA, ONT.

B E T W E E N

THE DIRECTOR OF INVESTIGATION AND RESEARCH

Applicant

- and -

IMPERIAL OIL LIMITED

Respondent

AFFIDAVIT OF DONALD G. McFETRIDGE

I, Donald G. McFetridge, of the City of Ottawa, in the Province of Ontario in Canada MAKE OATH AND SAY AS FOLLOWS:

1. I am a Professor of Economics at Carleton University and have been retained by the Director of Investigation and Research, Consumer and Corporate Affairs - Canada, to provide my opinion on the implications of

competition from imported motor gasoline from the merger of Imperial Oil Limited and Texaco Canada Inc. Now shown to me and attached as Exhibit "A" to this my affidavit is a copy of my Report.

2. The contents of this Report attached as Exhibit "A" to this my affidavit and the opinions expressed therein are true to the best of my knowledge, information and belief.

3. I make this affidavit pursuant to Rule 42(1) of the Competition Tribunal Rules.

SWORN before me at the)
City of Ottawa, in the)
Province of Ontario,)
this 19th day of July,)
1989.)

Donald G. McFetridge

A Commissioner of Oaths in
and for the Province of Ontario

This is **EXHIBIT "A"** to the Affidavit of Donald G. McFetridge sworn before me on July 19, 1989

A Commissioner of Oaths in and for the Province of Ontario

EXHIBIT "A"

ASSESSMENT OF THE IMPACT OF POTENTIAL IMPORT COMPETITION ON WHOLESALE GASOLINE PRICING IN ONTARIO AND QUEBEC

D.G. McFetridge

SUMMARY

The purpose of this report is to assess the extent of potential import competition in the market for motor gasoline in Ontario and Quebec.

I have examined two types of evidence. The first is evidence on the capacity of independent (i.e. non-refiner) marketers to import gasoline. The second is evidence on the effect of import prices on wholesale gasoline prices in Ontario and Québec.

With respect to the capacity of independents to import, the evidence is that there are large, well-established independents operating in each province with the capacity to import marine cargoes. Ontario independents also have the capacity to import by tanker truck from Buffalo, New York.

Current imports by independents account for about 3.5 per cent of Quebec's net supply and 1.5 per cent of Ontario's net supply. Independents have the physical capacity to import about 50 per cent of Quebec's requirements, almost 20 per cent of Ontario's, and about 30 per cent of the combined requirements of the two provinces.

They would not require a substantial increase in the wholesale price of gasoline in Quebec or Ontario relative to the off-shore price or United States price to induce them to increase their import volume.

The conclusion which follows from the examination of the import capacity of independents is that at present they have the ability to constrain attempts by domestic refiners to reduce supply and increase wholesale prices.

With respect to the relationship between wholesale gasoline prices in Toronto and Montreal and prices prevailing in the United States, a statistical examination of the evidence reveals that:

(a) The Buffalo wholesale price of gasoline landed in Toronto constitutes an effective ceiling on the Toronto wholesale price. The Toronto price does not adjust instantaneously to changes in the Buffalo price (or the exchange rate) but over a full cycle the average price in Toronto does not differ from the Buffalo price landed in Toronto.

(b) The Montreal wholesale price of gasoline responds to changes in the U.S. Gulf Coast price (landed in Montreal) but the response lag is relatively

long. Over a full cycle, however, the average wholesale price in Montreal does not differ statistically from the U.S. Gulf Coast price landed in Montreal.

The price evidence is consistent with a perception by domestic refiners that the elasticity of supply of imports is high and that any sustained excess of domestic over foreign wholesale prices would result in a significant loss of volume. Given the ceiling which the price of imported motor gasoline places on Ontario and Quebec wholesale prices, it is unlikely that the merger could lead to and sustain a substantial increase in wholesale gasoline prices in Ontario and Quebec.

1. Introduction

The purpose of this memo is to assess the extent to which the pricing behaviour of Ontario and Quebec gasoline refiners is constrained by imports or the threat of imports. Specifically, the question is whether an attempt by domestic refiners to restrict their output and thus to raise domestic gasoline prices would be thwarted within a reasonable period of time by an increase in imports.

A summary characterization of import supply conditions is the import supply function. This indicates the quantity of imports which would be supplied to the domestic market at any given domestic price. The estimation of an import supply function for the product, region and time period in question is not possible (motor gasoline imports into Ontario are available only on an annual basis since 1985).

In the absence of direct statistical estimates, import supply elasticities can be inferred indirectly from two sources. These are:

(a) estimates of the capacity of independents to import gasoline and;

(b) comparisons of the behaviour of domestic and foreign gasoline prices.

II. The Capacity to Import

With respect to the capacity to import, the issues are:

(a) Whether there are significant institutional constraints on imports;

(b) Whether independent (ie., non refiner) marketers have ability to import enough gasoline from the U.S. and offshore to make it unprofitable for domestic refiners to attempt to restrict output and raise price.

Issue (b) breaks down further into two basic questions. These are:

(a) What is the potential capacity of independents to import?

(b) How much would the domestic price have to rise before that capacity is utilized?

Institutional Constraints

With respect to institutional constraints, the following questions arise:

(a) Are there governmental barriers to importing gasoline?

There is no tariff on gasoline imported into Canada. There are no quotas or other non tariff barriers on gasoline imports. The imposition of restrictions on imports from the United States must be regarded as unlikely given the Canada-U.S. free trade agreement. The imposition of restrictions on imports from offshore must also be

regarded as unlikely given the government's stated commitment to trade liberalization. It is also considered unlikely that the U.S. would impose any restrictions on gasoline exports to Canada.

(b) Are the quality differences between Canadian and imported gasoline such as to constitute an impediment to importing?

Gasoline from some U.S. sources may have a lower octane rating than Canadian refined gasoline. Blending imported gasoline with domestic gasoline is normally sufficient to remedy this problem. A facility capable of raising the octane rating of imported gasoline by one point can also be installed at modest cost.

Physical Constraints

The current capacity of independents to import gasoline is as follows:

(a) Quebec

Imports into Quebec come principally via tanker from New York harbour, Rotterdam and other offshore sources. Imports by truck are limited. Trucking from Albany is generally not competitive with marine cargoes.

There are two large independents operating terminals with year-round marine access in Quebec. Olco Petroleum Group operates terminals in Quebec City and Montreal. Les Huiles Norco operates a terminal in Montreal. These firms

market gasoline both through their own networks and through other independents.

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It is not unreasonable to conclude that the ability of non refiners to import is such that the landed price of imported gasoline constitutes an effective ceiling on the wholesale price of gasoline set by Quebec refiners over the medium to long term. This should, of course, be confirmed with reference to the price data themselves. This is done in Section III.

(b) Ontario

Imports of gasoline enter Ontario principally via tanker truck from Buffalo and via marine cargo.

(i) Imports by Tanker Truck

Most of Ontario's independent terminal operators are located within economic trucking distance from Buffalo. Gasoline can also be trucked directly from terminals in Buffalo to individual service stations in southern Ontario.

The important question is, again, whether given an increase in the wholesale price set by Ontario refiners, independent Ontario marketers could readily increase their gasoline imports from Buffalo thus making the price increase unprofitable. This depends on, among other things:

- the availability of additional gasoline in the Buffalo area;
- the availability of tanker trucks;
- the capacity of border points to handle additional traffic.

Gasoline enters the Buffalo area by truck from refineries in Pennsylvania and by pipeline from New York harbour and Philadelphia.

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Current Canadian liftings plus the additional gasoline that could be made available in Buffalo should the demand exist total 20,000 barrels per day or 7.3 million barrels per year. This amounts to 9.3 per cent of 1988 Ontario net supply.

There does not appear to be any problem obtaining the tanker trucks required to haul this additional gasoline to Canadian terminals and service stations. The number of

additional trucks required is not large (20 trucks making three trips per day could bring in additional 9000 bbl/day). Similarly, the additional number of border crossings involved is small (in percentage terms) and the contribution of additional imports to border congestion would be minimal. Congestion could occur, if anywhere, at U.S. terminals especially if liftings by Canadians were to increase dramatically. This problem could be solved by increasing rack capacity if it appeared that additional Canadian demand would be sustained.

(ii) Imports of Marine Cargoes

There are six major operators of marine accessible terminals in Ontario. These are Universal, Petrocor, McAsphalt, Olco, Roy-L and Montank. There is presently marine accessible capacity to store 570,000 barrels of motor gasoline. Some 200,000 barrels of additional storage capacity could be obtained at modest cost by converting additional distillate tankage.

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Thus there is over 900,000 barrels of marine accessible storage capacity in the hands of independent marketers in Ontario.

This storage capacity will support less in the way of annual throughput than it would if it were accessible year-round by ocean-going tankers. A reasonable estimate

is that the six major independent terminal operators could handle 7.7 million barrels of marine cargo annually. This amounts to 9.8 per cent of Ontario net supply.

Given that the marine terminal capacity exists to expand imports significantly the question remains whether there is sufficient clean cargo tanker capacity suitable for use in the St. Lawrence Seaway. The answer is that, given the current size of the fleet, there may be shortages of vessels at certain times of the year. It is also the case, however, that the number of vessels available for the gasoline trade could readily be expanded over a reasonable period of time.

(iii) Marine Cargo plus Trucks

Summing the potential capacity of independents to import gasoline via marine cargo and via trucks yields an import capacity of 15 million barrels of gasoline annually. This amounts to 19 per cent of 1988 Ontario net supply.

(iv) Imports via Montreal

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Oleo's Montreal terminal is connected with the Trans-Northern pipeline through which it could ship gasoline to Ottawa and as far west into Ontario as Maitland. Thus, in the event of a supply restriction in Ontario, additional imports could readily flow into eastern Ontario via Montreal. The Trans-Northern is most heavily used during

the winter season to move heating oil from Ontario refineries to Quebec. Capacity would be available for western movement of gasoline during the period of peak demand for that product.

Assessment

Independent (ie., non-refiner) terminal operators in Quebec have the capacity to import approximately 51 per cent of that province's motor gasoline requirements. Independent terminal operators, brokers and wholesalers have the capacity to supply almost 20 per cent of Ontario's requirements. At present imports by independents account for roughly 3.5 per cent of Quebec's net supply and roughly 1.5 per cent of Ontario's net supply. It is clear that there is significant potential for expanding the gasoline imports of the independent sector. It is also clear that it would not take a significant increase in the Canadian price relative to foreign prices to induce this expansion. The reason is that the infrastructure required is in place.There could be some rack congestion in Buffalo and, perhaps, longer waiting times for clean product vessels at some points in the year. These congestion costs should not persist over the longer term.

This ability of independents to expand imports considerably without appreciably increasing their unit cost implies that this group is in a position to frustrate

attempts by domestic refiners to restrict their output and raise wholesale prices. Suppose, for example, Ontario refiners attempted to restrict output and raise the Ontario wholesale price by 10 per cent (about 2 cents per litre). According to demand elasticity studies the elasticity of demand for gasoline in the short-run (under two years) is around 0.4. This implies that in order to raise the wholesale price by 10 per cent Ontario refiners would have to reduce their supply of gasoline by about 4.1 per cent or about 3.2 million barrels per year. Over the longer term when vehicle choices and locational patterns can adjust, the required output reduction would be larger.

Independents could and would have an incentive to frustrate any attempt to raise the wholesale price. As the analysis above has demonstrated, independents have the capacity to bring much more than 3.2 million additional barrels of gasoline from the United States or from offshore. Their incentive to do so lies in the higher profit associated with their increased share of the Ontario market. The same reasoning applies to Quebec or to Ontario and Quebec together.

III. Price Relationships

Introduction

The examination of the ability of independent (ie., non refiner) gasoline marketers to import product from either the U.S. or offshore has revealed that with existing infrastructure imports could supply as much as 50 per cent of Quebec requirements, 20 per cent of Ontario requirements or about 30 per cent of Ontario and Quebec requirements.

The threat of imports thus constrains domestic pricing although it need not eliminate domestic pricing discretion entirely. There are a number of possibilities here. First, the import supply function could be infinitely elastic. The domestic producers could either be price takers each producing a quantity at which their respective marginal costs were equal to the landed price of imports or be price setters, jointly pricing to exclude imports. The latter is the traditional (Eastman-Stykolt) limit pricing model. The latter is also consistent with the existence of nontransitory exports while the former is not. In either case, under these models, any change in the foreign price or transportation costs to Canada would be fully reflected in the Canadian price. With the domestic price equal to the landed price of imports and the supply of imports infinitely elastic then the merger has no price consequences and cannot be welfare reducing.

A second possibility is that due to congestion or other

factors the cost of importing gasoline is an increasing function of the volume imported. The elasticity of import supply is finite. In this case the marginal landed cost of imports is always equal to the Canadian price but the marginal cost of imported gasoline exceeds its average cost. Under these circumstances the Canadian wholesale price could exceed the price in the U.S. plus average transportation costs to Canada on a continuing basis. Canadian producers would have some pricing discretion and changes in either the foreign price or average transportation costs need not be fully reflected in the domestic price.

In sum, evidence that domestic wholesale gasoline prices exceed, on average, the foreign wholesale price plus average transportation costs to Canada and do not respond fully to changes in the foreign price points in the direction of a finite supply elasticity and at least some domestic pricing discretion. Evidence that the Canadian price does not exceed, on average, the foreign wholesale price plus average transportation costs and that the Canadian price adjusts fully to changes in the foreign price points in the direction of an infinite elasticity of import supply and an absence of domestic pricing discretion.

Data and Models

The product examined here is motor gasoline. The geographic areas examined are Ontario and Quebec. These geographic areas may or may not be economic markets. This does not matter. The only question here is whether and to what extent sellers in these areas are constrained in their pricing by sellers located outside these areas. If they are weakly constrained or unconstrained then the geographic market would coincide with or be smaller than these areas. If they are tightly constrained the geographic market encompasses a wider area.

The type of transaction examined is the wholesale transaction. The question is thus the extent to which imports or potential imports constrain wholesale price setting. Posted wholesale prices are called rack prices. Only Toronto and Montreal rack prices are examined. We have assumed that rack prices at other delivery points in these two provinces differ from either Toronto or Montreal only by transportation costs and move in lockstep with them.

Two types of data are used. The first is weekly data. It is supplied by IOL and was the basis for their submission. There are eight basic series each running from the first week in January 1987 to the last week in February 1989. These series are:

TRL_t = IOL Toronto rack price, leaded motor gasoline observed on the Friday of week t

TRU_t = IOL Toronto rack price, unleaded motor gasoline

BRL_t = Buffalo average (highest and lowest) rack price, leaded motor gasoline plus transportation observed on Friday of week t [in Canadian dollars/litre]

BRU_t = Buffalo average rack price, unleaded motor gasoline plus transportation

MRL_t = IOL Montreal rack price, leaded motor gasoline

MRU_t = IOL Montreal rack price, unleaded motor gasoline

GCL_t = U.S. Gulf Coast leaded gasoline average of bid and asked spot prices two weeks prior to week t plus transportation

GCU_t = U.S. Gulf Coast unleaded gasoline price plus transportation

The second type of data is daily data. It is supplied by TCI. These data run from January 1, 1986 to April 12, 1989. They include an average Buffalo rack price and six Toronto rack prices (Esso, Shell, Sunoco, Ultramar, Petrocan and Turbo). For present purposes only the IOL Toronto rack and the Buffalo rack prices have been used. These series are defined as:

TRD_t = IOL Toronto rack, unleaded motor gasoline on day t

BRD_t = (((BP$_t$/3.78541) + 1.57) + XR$_t$) − 0.5

where[1]

BP_t = average Buffalo rack in U.S. cents per U.S. gallon on day t

XR_t = Canadian dollars/U.S. dollars on day t

The basic price model tested is suggested and explained in the IOL submission. To use Toronto as an illustration the hypothesis is that the desired Toronto price is a mark-up on the Buffalo price plus transportation from Buffalo. Specifically:

$$TR^* = a + dBR_t \qquad (1)\ a \geq 0,\ d \geq 1$$

The actual Toronto price cannot be adjusted to the desired Toronto price instantaneously so that

$$TR_t - TR_{t-1} = b(TR^* - TR_{t-1}) \qquad (2)$$

Substituting for TR* we get

$$TR_t = ab + dbBR_t + (1-b)TR_{t-1} \qquad (3)$$

When all adjustment is complete $TR_t = TR_{t-1}$ and

$$TR = a + dBR \qquad (4)$$

The Toronto price equals the Buffalo price after full adjustment if a = 0 and d = 1.

The model estimated is given by equation (3). The hypothesis that a = 0 is not rejected if the estimated constant term in (3) does not differ statistically from zero. The hypothesis that d = 1 is not rejected if the sum

1. Freight from Buffalo is assumed to be 1.5¢ U.S. cents per litre. A pick-up charge of .6 Canadian cents per litre is avoided when gasoline is lifted in Buffalo rather than Toronto.

of the coefficients on BR_t and TR_{t-1} does not differ statistically from one.

Reporting first, the results obtained using the TCI daily data we get

$$TRD_t = .0671 + .0346\ BRD_t + .9632\ TRD_{t-1}$$
$$(0.96)\quad (6.93)\qquad (169.54)$$

$n = 832\ R^2 = .99\ D.W. = 2.04\quad h = -0.54$

(t-ratios in brackets)

The null hypothesis that the constant term is zero cannot be rejected at the usual levels of significance. The estimates of db and (1-b) sum to .9978. The hypothesis that db + (1-b) = 1 implying d = 1 cannot be rejected at the usual significance levels.[1] The model explains 99 per cent of the variation in the Toronto rack price and there is no evidence of autocorrelation (Durbin's h is not statistically significant).

The Toronto price does not adjust instantaneously to the Buffalo price. The mean adjustment lag is (1-b)/db = 963/35 = 27.5 days. This means that it takes 27.5 days for half of any discrepancy between the desired and actual Toronto price to be eliminated.

Turning now to the weekly data. The results for Toronto are:

1. t = -.0022/0033 = -0.66

(a) Leaded:

$$TRL_t = -0.312 + 0.159\ BRL_t + 0.857\ TRL_{t-1}$$

$$(-0.61) \quad (5.26) \qquad (28.21)$$

$n = 111$ $R^2 = .94$ D.W. = 2.11 h = -0.61

(b) Unleaded:

$$TRU_t = -0.214 + 0.173\ BRU_t + 0.844\ TRU_{t-1}$$

$$(-0.40) \quad (5.06) \qquad (23.81)$$

$n = 111$ $R^2 = .94$ D.W. = 1.97 h = 0.20

The results having the following characteristics:

(a) the constant terms do not differ statistically from zero

(b) the respective sums of db and (1-b) do not differ statistically from one

(c) there is no evidence of misspecification

(d) the mean lags are 5.4 weeks and 4.9 weeks respectively.

Several variations of this model were run. The first allowed for seasonality and found none. The second allowed for an asymmetric response to the Buffalo price, to wit, the Toronto price responds more quickly to an increase in the Buffalo price than to a decrease. This hypothesis was tested by creating the following dummy variable:

$DBPR = 1$ if $BRL_t > BRL_{t-1}$

$= 0$ otherwise

The basic model was then re-estimated with the following result:

$TRL_t = -0.312 + 0.163BRL_t - 0.0007\ DBPR*BRL_t + 0.854TRL_{t-1}$

(0.61) (4.86) (-0.23) (26.01)

n = 111 R^2 = .94 D.W. = 2.10 h = -0.61

If the asymmetry hypothesis is correct the coefficient of the interaction dummy $DBPR*BRL_t$ should be statistically significant and positive. It is neither. The asymmetry hypothesis is not supported by this result.

The model was also estimated using five different Toronto transaction prices in place of the (posted) Toronto rack price. Only the results for unleaded gasoline are presented here. The transactions prices are defined as:

$ITTU_t$ = representative IOL Toronto transaction price on Friday of week t for unleaded motor gasoline.

$TTTU1_t$ = TCI Toronto transaction price for unleaded motor gasoline -

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$TTTU2_t$ = TCI transaction price -

$TTTU3_t$ = TCI transaction price -

The results are as follows:

(a) $ITTU_t = 0.430 + 0.148\ BRU_t + 0.869\ ITTU_{t-1}$

(-1.08) (5.48) (29.30)

n = 111 R^2 = .96 D.W. = 2.03 h = -0.14

mean lag = 5.9 weeks

(b) $TTTU1_t = -0.413 + 0.094\ BRU_t + .926\ TTTU1_{t-1}$

(-0.66) (2.33) (29.85)

n = 111 R^2 = .94 D.W. = 2.03 h = -0.18

mean lag = 9.9 weeks

(c) $TTTU2_t = -0.587 + 0.143\ BRU_t + 0.889\ TTTU2_{t-1}$

(-1.13) (4.09) (29.45)

n = 111 R^2 = .95 D.W. = 2.09 h = -0.52

mean lag = 6.2 weeks

(d) $TTTU3_t = 0.023 + .079\ BRU_t + 0.920\ TTTU3_{t-1}$

(0.03) (1.82) (26.38)

n = 111 R^2 = .92 D.W. = 1.84 h = 0.88

mean lag = 11.6 weeks

These results have the following characteristics:

(a) they all have constant terms that are statistically zero and the respective sums of the parameters db + (1-b) do not differ from one implying a = 0 and d = 1. In this they are identical to the results for posted prices.

(b) they imply adjustment lags which are longer, if anything, than is the case with posted prices. This is especially true of the Texaco transaction prices. These are prices at which gasoline is not being lifted. None of these results imply that transaction prices respond to Buffalo more quickly than posted prices.

The model was also estimated with the Buffalo price expressed in U.S. cents per litre with the exchange rate entering separately. The hypothesis here is that the Buffalo price serves as a signal or focal point but does not imply anything about import competition. If this is the case the Toronto rack price will not respond to changes in the exchange rate. While the specification of this

model leaves something to be desired it does show that the exchange rate matters.[1] Indeed the results show that the short-run response elasticities are virtually identical (at 0.15) and that the long-run response elasticities are both one. The exchange rate matters as much as the Buffalo price in both the short and long-run. The implication is that it is the threat of imports that matters rather than the Buffalo price as a focal point.

Montreal results with the weekly data are as follows:

(a) Leaded

$$MRL_t = 0.655 + .044\ GCL_t + 0.926\ MRL_{t-1}$$

(1.15) (2.04) (28.24)

n = 111 R^2 = .91 D.W. = 1.99 h = 0.04

mean lag = 21.0 weeks

(b) Unleaded

$$MRU_t = 0.102 + 0.033\ GCU_t + 0.965\ MRU_{t-1}$$

(0.23) (1.24) (39.56)

n = 111 R^2 = .96 D.W. = 1.96 h = 0.21

mean lag = 29.2 weeks

Montreal rack prices are at best weakly related to the contemporaneous Gulf Coast price and with a long lag. The constant terms are not significant. In the leaded model bd + (1-b) = .969. The standard deviation of this sum is .027. The null hypothesis that the sum is one (so d = 1)

1. At the time of writing nonlinear estimation has as yet not yielded meaningful results.

cannot be rejected (t = -1.15). In the unleaded model bd+(1-b) = .998. The standard error of this sum is .022. The null hypothesis that the sum is one cannot be rejected.

The Gulf Coast price lagged one week has a statistically stronger effect. The results are:

(a) Leaded

$$MRL_t = 0.661 + 0.053\ GCL_{t-1} + 0.917\ MRL_{t-1}$$

$$(0.57) \quad (2.38) \qquad (27.75)$$

n = 111 R^2 = .92 D.W. = 1.97 h = 0.20

mean lag = 18.3 weeks

(b) Unleaded

$$MRU_t = 0.003 + 0.049\ GCU_{t-1} + 0.956\ MRU_{t-1}$$

$$(0.01) \quad (1.86) \qquad (39.28)$$

n = 111 R^2 = .96 D.W. = 1.95 h = 0.21

mean lag = 20.5 weeks

In both cases the sume bd+(1-b) does not differ statistically from one. If the Gulf Coast price lagged one period is replaced by the Gulf Coast price lagged two periods the result for leaded gasoline is virtually identical. The result for unleaded gasoline is marginally weaker statistically but virtually the same in its implications.

Turning to Montreal transaction prices for unleaded gasoline we have two transaction price time series. These are:

TTMU1 = Texaco Canada unleaded transaction price with

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TTMU2 = Texaco Canada unleaded transaction price with

Applying the same model we get:

$$TTMU1_t = -0.183 + 0.065CU_t + 0.948\ TTMU1_{t-1}$$

(0.42) (2.34) (37.91)

n = 111 R^2 = .96 D.W. = 1.81 h = 1.03

Mean lag = 14.6 weeks

$$TTMU2_t = -0.488 + 0.066\ GCU_t + 0.960\ TTMU2_{t-1}$$

(1.19) (2.34) (45.59)

n = 111 R^2 = .97 D.W. = 2.26 h = -1.40

Mean lag = 14.5 weeks

The Montreal transaction prices are somewhat more responsive to the Gulf Coast price than the Montreal rack price. The partial correlation is stronger and the mean lag is almost 15 weeks shorter. This is a contrast to the Toronto results where the transaction prices and rack price produced very similar results.

Insofar as the series provided by Texaco are concerned, the Montreal transaction prices show considerably more variability (more frequent changes) than the Toronto prices. This may reflect the frequency with which the Toronto customers lift from Texaco rather than any difference in the market.

The weekly model may well hide some of the responsiveness of Montreal transaction prices to foreign price changes. Prices to often change more than

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once per week. These changes do not show up in the Friday observations which are matched to the Gulf Coast price. Thus Montreal transaction prices are more flexible than is implied by the weekly series used here.

The basic result for Montreal is that while Montreal prices respond relatively slowly to Gulf Coast prices they do not differ, on average, from them. The Montreal price models have the counter-intuitive implication that the foreign supply function is less elastic in the case of Montreal than in the case of Toronto.

The results obtained for the weekly data are for the period January 1987-February 1989. As such, they extend the IOL sample period by some six months. It has been suggested that the additional observations be used to test the "learning hypothesis", to wit, that the majors thought that deregulation would result on a more serious import threat than it actually has. Having learned that imports do not constitute a serious threat, the majors begin to raise their Toronto rack prices relative to Buffalo. The result is an upward drift in either the a or d coefficient or both.

Estimation of the daily model for the period January 1, 1988-April 1989 yields the result:

$$TRD_t = -0.010 + 0.037\ BRD_t + 0.965\ TRD_{t-1}$$

$$(-0.06) \qquad (5.65) \qquad (121.7)$$

$n = 468 \quad R^2 = .98 \quad D.W. = 2.07$

mean lag = 26.1 days

A comparison of this result with the daily model estimated for the period January 1, 1987, reveals that the model estimated for the later period has a smaller constant term but that the two models do not differ statistically. Thus at least as far as Toronto pricing is concerned the evidence does not support the argument that the majors have learned that imports are not a source of concern. If anything it points in the opposite direction.

An attempt was made to experiment with alternative lag distributions. The model represented by equation (3) constrains the weights on lagged values of the independent variable to decline geometrically. That is, the equation

$$TRL_t = .01 + .15\ BRL_t + .85\ TRL_{t-1}$$

can also be written as

$$TRL_t = .01 + .15\ BRL_t + .128\ BRL_{t-1} + .108\ BRL_{t-2} + .092\ BRL_{t-3} + .078\ BRL_{t-4} + \ldots$$

where the sum of the coefficients on the BRL_{t-i} approaches one as i becomes very large.

This type of lag distribution assigns the greatest importance to the most recent value of the independent variable (ie., BRL_t). It may be the case that the delay in responding to the Buffalo price is such that an earlier value of the independent variable say BRL_{t-2} has the greatest weight.

In order to allow for this possibility the models were re-estimated with two lagged values of the

dependent variable. For example:

$$TRL_t = a_0 + a_1 BRL_t + a_2 TRL_{t-1} + a_3 TRL_{t-2}$$

If $a_2 > 1$ and $a_3 < 0$ this specification implies a lag distribution with one hump (ie., an inverted u). It proved to be the case, however, that either $a_2 < 1$ or $a_3 > 0$ or both. As a consequence, this specification also implies geometrically declining weights and does not constitute an improvement on equation (3).

A second alternative lag distribution was employed with the daily data. This approach constrains the weights on the lagged values of the independent variable to lie along a polynomial of a specified order. This is called the polynomal distributed lag (PDL) or Almon lag technique. Experiments were run with up to 60 lagged values of the independent variable itself lagged up to two weeks. This "extreme" specification hypothesizes that the Toronto price depends on all the values of the Buffalo price between 15 and 75 days earlier. The result of this experiment is that the sum of coefficients of the 60 lagged values of the Buffalo price is .89. There is a positive and highly significant constant term. Unfortunately the lag distribution makes no sense. It is a "u" followed by an inverted "u". Moreover the Durbin Watson is 0.08 implying a serious misspecification of some sort. It must be concluded that improving on the "naive" geometrically declining lag distribution implies by the IOL model

(equation 3) is going to be very difficult if it is possible at all.

Some models were also estimated using "monthly" data supplied by TCI. On further inquiry these data proved to be monthly averages of the daily data described above. The averaging process throws away information leaving only 24 monthly observations to work with. Moreover, the averaging induces autocorrelation which causes further problems. The use of monthly averages became indefensible when the underlying daily and weekly data were made available.

While results obtained using the 24 monthly observations are not reported, two experiments performed with the monthly data are worth noting. First, the question arises as to whether the Toronto rack price is responding to the Buffalo rack price or to the price of crude oil which is virtually the same in both Canada and the U.S.

To test the hypothesis that it is the (North American) price of crude oil rather than the price of U.S. gasoline to which Canadian rack prices are responding the price of Canadian crude in Chicago in Canadian dollars per litre was added as an explanatory variable in equation (3). The result is unequivocal. The crude oil price is statistically insignificant ($t = -0.37$) while estimates of the other parameters and their respective t-ratios remain virtually unchanged.

Second, if Ontario refiners are truly constrained by international factors their respective refining margins should vary with both U.S. gasoline and crude oil prices. Specifically, given the Buffalo rack price, an increase in the Canadian dollar price of crude oil due either to an increase in the U.S. dollar price or a depreciation of the Canadian dollar, should reduce the refining margin. Given the price of crude oil an increase in its Buffalo rack should increase the refining margin.

This hypothesis is tested using

, the TCI monthly Buffalo rack and the price of Canadian crude in Chicago. Both the Buffalo rack and the Chicago crude oil prices are highly significant and the correct sign.

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Interpretation of Results

The statistical results reported in the previous section imply that in the case of Toronto that:

(a) The Toronto rack and transaction prices are, on average, just equal to the Buffalo rack price (in Canadian dollars per litre) plus transportation from Buffalo.

(b) The Toronto price does not adjust immediately to a change in the Buffalo price. It takes about four weeks for hald the required adjustment to occur. A typical adjustment pattern would be:

Week	Percentage Adjustment Completed
1	18
2	33
3	45
4	55
5	63
6	70
7	75
8	79
9	83
10	86
11	88
12	90
13	92
14	93
15	94
16	95

What do these results imply about the elasticity of foreign supply? First, the long-run equality of the Toronto and Buffalo prices implies that:

(a) The Buffalo price constitutes a ceiling (a binding constraint) on the Toronto price.

(b) The actual or perceived elasticity of foreign supply is infinite.

Second, the lag in the adjustment of Toronto to Buffalo prices implies that the short-run import supply elasticity is finite. That is, the marginal cost of imports is an increasing function of the quantity of imports supplied in the short-run. In the short-run the delivery cost of the marginal litre exceeds the average cost. There are adjustment costs of some sort and these costs serve to limit the potential import response over the short-term, say, under six weeks. Over the longer term, say more than twelve weeks the supply of imports can be regarded as infinitely elastic.

The adjustment lag does not imply that the Canadian and United States gasoline markets are not linked or that Canadian producers currently have any market power. It implies only that over a relatively short period (much shorter than the United States Justice Department's two year horizon) the supply function of imports is upward sloping. Over the relevant period it is or is perceived to be infinitely elastic.

IV. Overall Assessment

Imported gasoline presently constitutes about 12 per cent of Quebec's net supply and about 3 per cent of Ontario's net supply. The relatively small proportion of requirements currently supplied by imports does not imply that gasoline consumers have no viable short-run [illegible]. The

issue is not what imports are but what they could be. The examination of the capacity of independents to import reveals that as much as 30 per cent of Ontario and Quebec requirements could be met from imports by independents. It is highly unlikely that domestic market conditions would be such as to require this level of imports. But the threat is there and it is reflected in the pricing policies of domestic refiners. This is most clearly evident in Ontario. The evidence is very strong that Ontario refiners are pricing to meet the landed price of imports. The implication is that the refiners' perception of the market situation is that higher prices would induce additional imports resulting in a loss in volume and would not, as a consequence, be profitable. Thus notwithstanding the relatively small proportion of the market accounted for by imports, the influence of imports on domestic market prices is significant. The merger does not change this.

The situation in Quebec differs in some respects. The province has historically been open to imports of refined product. There are two large well-established independents with the capability of supplying a large fraction of provincial requirements from imports. Rack prices do not differ on average (allowing for adjustment lags) from Gulf Coast plus transportation costs. Transaction prices show considerable volatility - more than is shown by the available Toronto prices. On the other hand, Montreal on a

prices are not as closely correlated with the Gulf Coast as Toronto is with Buffalo. This could be taken to imply that Montreal pricing is more insulated from international factors than is Toronto pricing. It might also imply that Montreal pricing is simply subject to a more complex set of international determinants. This interpretation is more consistent with the import quantity and capacity data and is more persuasive.

Taking the two provinces together the potential competition from imports is such that domestic wholesale prices above the landed price of imports would not be profitable in the short-run, let alone over two years. The merger does not change this and is, therefore, unlikely to result in any change in domestic wholesale pricing behaviour.