IN THE COMPETITION TRIBUNAL

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

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

B E T W E E N:

THE DIRECTOR OF INVESTIGATION AND RESEARCH,

Applicant

- and -

IMPERIAL OIL LIMITED,

Respondent

AFFIDAVIT

I, **DAVID DORENFELD**, of the City of Toronto, in the Regional Muncipality of Metropolitan Toronto in the Province of Ontario, Manager, Economic Studies and Outlook at Imperial Oil Limited, the Respondent, MAKE OATH AND SAY AS FOLLOWS:

1. In my capacity of Manager, Economic Studies and Outlook, at Imperial Oil Limited, I commissioned Professor Leonard Waverman of the University of Toronto (Department of Economics) to prepare a report concerning the settlement

reached between Imperial Oil Limited and the Bureau of Competition Policy regarding the acquisition by Imperial Oil Limited of Texaco Canada Inc. I requested Professor Waverman to analyze the extent to which the relief described in the settlement reflected in the Draft Consent Order dated June 29, 1989, provides an effective remedy to any lessening of competition that might arise in the refining and wholesale distribution of petroleum products in Canada as a result to the acquisition of Imperial Oil Limited of Texaco Canada Inc.

2. Attached hereto as Exhibit "A" to this my affidavit is a true copy of the report prepared by Professor Waverman pursuant to the aforesaid request.

SWORN before me at the)
City of Toronto, in the)
Regional Municipality of)
Metropolitan Toronto in)
the Province of Ontario)
this 24th day of July, 1989)

Commissioner for Taking
Affidavits

2339D/1

This is Exhibit "A" to the Affidavit
of David Dorenfeld, sworn before
me on the 24th day of July, 1989

A Commissioner, etc.

Professor Leonard Waverman, Ph.D

July 24, 1989

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Exhibit "A"

Report

A. Introduction

1. I was requested by Imperial Oil Limited ("Imperial") to prepare a report which analyzes the extent to which the provisions contained in the proposed settlement reflected in the Draft Consent Order dated June 29, 1989 ("DCO") provide an effective remedy to any lessening of competition in refining and wholesale distribution of petroleum products in Canada that might arise as a result of the acquisition by Imperial of the shares of Texaco Canada Inc. ("Texaco").

2. The Merger Branch of the Bureau of Competition Policy (the "Merger Branch") and Imperial provided information to me on the nature of the business as conducted by the parties to the proposed acquisition as well as the Notice of Application, the DCO and the Consent Order Impact Statement filed July 7, 1989 (the "COIS"). As well, additional information on the nature of competition in Canadian gasoline refinery and wholesale distribution markets was provided to me by Imperial including all of the relevant submissions it made to the Merger Branch regarding the acquisition. This material also included a report prepared by Donald W. Pfeifer for

Imperial entitled "Gasoline Supply Availability to the Canadian Independents ex the New York State Market." I have also reviewed the relevant sections of the Restrictive Trade Practices Commission's 1986 Report, Competition in the Canadian Petroleum Industry (the "RTPC Report") as well as material filed by Imperial and Gulf Canada in the hearings preceding that Report. These constitute the main sources of firm and industry information for this document.

3. In this report, I will focus my review on the areas in which, according to paragraph 2 of the Notice of Application, the Director alleges that competition is likely to be substantially lessened as a result of the acquisition namely:

(i) the elimination of a major refiner-marketer in the Atlantic Canada region;

(ii) the elimination of a significant supply alternative for non-integrated marketers in Quebec and Ontario;

(iii) the reduction in the availability of terminalling facilities for the storage and distribution of refined petroleum products across Canada; and

(iv) the increase in the opportunity for interdependent market behaviour among refiner-marketers.

In particular, my review will consider the likely competitive impact in the relevant Canadian markets of the remedies incorporated in the DCO and will assess whether those remedies adequately address the concerns of the Director listed above.

4. I will also, to the extent possible, consider the efficiencies that Imperial anticipates it will derive in its refining and distribution operations as a result of the transaction.

B. <u>Atlantic Canada</u>

5. In the Statement of the Grounds for the Application under Section 92, and the Material Facts on which the Director Relies, filed with the Notice of

Application (the "Statement of Grounds"), the Overview of the Industry which was filed as Appendix 2 of the Notice of Application (the "Overview") and the COIS, the Director enumerates a number of concerns regarding the acquisition by Imperial of the Atlantic region operations of Texaco.

6. The DCO provides for divestiture by Imperial of the Eastern Passage refinery, four terminals and 197 service stations in Atlantic Canada. Further, paragraphs 14 and 17 of the DCO indicate that divestiture of the refinery and terminals is, to the extent reasonable and possible, to be made to purchasers that intend to continue to operate the facilities.

7. The assets to be divested are virtually equivalent to those held by Texaco in the Atlantic region prior to the transaction at issue and such assets are to the extent reasonable and possible to be divested to purchasers committed to continue to operate those assets. Therefore, as stated in paragraphs 21, 27 and 31 of the COIS, I believe there is little likelihood the acquisition will lead to any lessening of competition in the refining and wholesale distribution of petroleum products in that region.

C. Supply to Independent Marketers in Ontario/Quebec

C.1 Background

8. Paragraph 38 of the Overview provides data on the 1988 effective refining capacity in Ontario and Quebec (herein referred to collectively as "Central Canada"). Pre-merger, Imperial held 15.0% of this capacity in one refinery at Sarnia, and Texaco held 13.0% of this capacity in one refinery at Nanticoke. In total in 1988 there were nine refineries in the Central Canada region, which was down from 15 six years earlier (see RTPC Report p. 215). The nine are owned by six different firms. After the merger Imperial would be marginally larger than the second and third largest firms, Petro-Canada and Shell (28% and 23.3% respectively as measured by 1988 effective capacity).

9. As stated in paragraphs 23 and 24 of the Statement of Grounds and paragraphs 19, 20, 29 and 30 of the Overview, the combination of high sunk costs and large economies of scale has led the refining sector of the petroleum industry to be more highly concentrated than other manufacturing sectors throughout the world. Post-merger, the three largest firms will own nearly 80% of the refining capacity in Central Canada. This level of

concentration, however, is similar to the level of concentration in the refining sector in other parts of Canada in which concentration is unaffected by the acquisition. In the Prairie region the three largest refiners own 80.6% of capacity and in the Pacific region 79.9% of capacity.

10. Paragraph 66 of the Statement of Grounds states that the Merger Branch has found that there will be significant efficiencies in operating the two refineries jointly. The Statement of Grounds also notes that, as a result of these operating efficiencies, together the two refineries will be able to supply substantially larger volumes of gasoline to the Central Canadian market.

C.2 Product Market

11. In Central Canada, the Director has focused his attention on the supply of transportation fuels rather than consider the supply of a larger number of refined petroleum products as was the case for Atlantic Canada. I concur that the Director's focus is warranted for the reasons set forth in paragraphs 11 and 12 of the Overview, namely, that the price elasticity of demand is elastic for refined petroleum products used for heat generation due to the ready availability of economically viable substitutes

including gas and electricity. As stated in paragraph 18 of the Overview: "[I]n summary, refined petroleum products used primarily to generate heat (light and heavy fuel oil) face strong competition from readily-available substitutes except for Atlantic Canada where oil continues to dominate". Thus, the focus on only transportation fuels in Central Canada is appropriate.

12. The Director's more narrow concentration on motor gasoline is also warranted. As stated in paragraph 15 of the Overview, motor gasoline comprises about 65% of all transportation fuels. Diesel fuel accounts for a further 22% of transportation fuel use. As diesel fuel and gasoline are relatively close substitutes, I would expect any variation in the relative price of diesel and motor gasoline to relate only to supply and demand conditions in the marketplace and not to the exercise of market power by a supplier of either fuel.

13. Diesel fuel and gasoline are close substitutes on the supply side by virtue of the way they are produced. To some extent the same hydrocarbons which are used to produce gasoline can be used to produce diesel fuel and vice versa. As a result, diesel fuel and gasoline are substitutable in production. Therefore, one would expect

changes in relative prices between the two to lead to changes in a refiner's output mix. Therefore, any attempt to raise the price will lead to an increase in supply. This should preclude any exercise of market power.

14. Further, as stated in paragraph 15 of the Statement of Grounds gasoline is of particular concern as it is used by virtually every consumer. Diesel fuel is primarily used by truckers who are often more sophisticated purchasers. Typically, they travel long distances and so can plan their purchases to avoid areas where prices are known to be high. In addition, trucking firms buy in large volumes so they can tap the import market if local prices are uncompetitive.

15. According to paragraph 53 of the Overview, large customers of jet fuel import supplies for their own use. This ability of consumers of aviation fuel to import supplies combined with the extent of international traffic of airlines can be expected to have a strong disciplinary effect on the marketing practices of domestic refiners and so the merger causes no concerns regarding a substantial lessening of competition in the supply of aviation fuels.

C.3 Geographic Market

16. The COIS states that each refinery has a geographic area in which it can effectively compete for gasoline sales. This area is a function of a number of factors, principally its costs of production, transport costs and the delivered cost of imported refined products. I agree with this approach.

17. Therefore, in considering whether Central Canada is a relevant market for competition analysis, I have looked at product movement within and from outside the region, the pricing of delivered product and the correlation between wholesale prices for gasoline in Central Canada and in the U.S.A. With regard to product movement, I consider that product may be "moved" either physically or contractually to the extent refiners exchange production to reduce transportation costs.

18. The Director states that Central Canada comprises a single geographic market in terms of petroleum refining and distribution for the reasons set forth in paragraphs 33 through 36 of the Overview and paragraph 53 of the Statement of Grounds. The Director's conclusion is appropriate considering:

(i) the extent of physical product movement between Ontario and Quebec;

(ii) the extent of the reciprocal supply agreements between refiners in Ontario and Quebec;

(iii) the availability of relatively inexpensive transportation means for moving product between the two provinces including the Trans-Northern Pipeline and the Saint Lawrence Seaway.

19. The inter-provincial movements of product are outlined in paragraph 34 of the Overview. As for reciprocal supply agreements, I am aware of significant exchange agreements of Texaco and Shell involving exchanges between Quebec and Ontario. The economic rationale for such agreements is that they help refiners avoid the inefficient transportation costs of cross-hauling. Thus, I agree with the Director that mere ownership of refineries is not a good indicator of the available suppliers in the region.

20. The Central Canadian gasoline refining market is a geographic market which is not isolated from other gasoline refining markets for the purposes of the Competition Act as prices for gasoline at the refinery in Central Canada are related to prices in other contiguous geographic areas.

21. There is sound economic theory to support the view that if pricing levels for a product are similar in two regions and prices move in tandem in the two regions, the two regions are, in fact, part of the same geographic market for a product. One of the most common statistical methods used to establish these relationships is regression analysis. Attached hereto as Exhibit 1 is a copy of a regression analysis performed by Dr. D. Dorenfeld, Ph.D. of Imperial with whom I consulted (the "Dorenfeld Study"). The analysis was done on price data for gasoline for two major markets in Central Canada as compared to equivalent price data for refined products from supply points in the East and Gulf Coasts of the U.S.A.

22. One possible draw-back of regression analysis is that it does not explain causation. That is to say that price levels may be similar in two regions but for different independent reasons. The Dorenfeld study

examines the most obvious potential source of spurious correlation: correlation of prices on both sides of the border with crude oil prices. With the exception of unleaded gasoline in Montreal, the results show a much closer relation between product prices than between product and crude prices on either side of the border. Moreover, as I indicate below a relationship can be established for price similarity by virtue of the available transportation infrastructure between Central Canada and regions close to it to allow for product importation or, more importantly, the threat of product importation as explained in paragraph 82 of the Overview.

23. The data and analyses provided in Appendix 1 of this report and paragraphs 69, 70, 74-78 of the Overview indicate conclusively that the Central Canadian gasoline refining market [is not separate from] other larger markets namely the Eastern U.S.A., the U.S. Midwest and the U.S. Gulf Coast. The proof is:

(a) a large number of foreign refineries are situated close to Central Canada by virtue of their location or connection to product pipelines with terminals close to Central Canada. In this report "close to" is

defined by the level of transport costs which separate the Central Canada gasoline market from other markets.

(b) a number of product pipelines service U.S. markets close to Central Canada. There are two product pipelines which terminate in the Buffalo, N.Y. area. The Atlantic and Mobil pipelines connect the Philadelphia area refineries to Buffalo. In addition, the Buckeye pipeline, which connects with the Atlantic pipeline at Caledonia, N.Y., carries petroleum products from marine terminals and refineries located in the New York/New Jersey area. The Buckeye pipeline is also connected to the Colonial pipeline which transports products from the U.S. Gulf Coast area. There are more than a dozen pipelines in the Michigan-Ohio area connecting local refiners to U.S. areas adjacent to South Western Ontario. In addition, the Texas Eastern and the Explorer/Wolverine pipeline systems carry products into the area from the U.S. Gulf Coast;

(c) the deregulation of the Canadian oil industry in June 1985 and the Canada U.S.A. Free Trade Agreement allows gasoline to pass freely from one side of the border to the other. Prior to that time, imports of petroleum products were constrained as noted in paragraph 32 of the Overview. Since deregulation gasoline imports have gradually increased according to paragraph 39 of the COIS;

(d) a number of terminals exist close to Central Canada. Appendix 2 to this report lists for example, the terminals in operation in the Buffalo area;

(e) the bridging costs (transportation, terminalling and other costs) between U.S. areas close to Central Canada and Central Canada are low. Costs via Great Lakes marine from Toledo/Cleveland/Detroit to Toronto/Hamilton range from 1.8 to 2.2 cents per litre. Costs via truck from Buffalo to locations in the Golden Horseshoe area are

0.8 to 1.5 cents per litre. Costs via ocean marine from the U.S. Gulf Coast to Montreal are 1.6 to 2.0 cents per litre;

(f) wholesale gasoline prices in the two major markets in Central Canada (Toronto and Montreal) are highly correlated with corresponding wholesale prices of gasoline imports (from Buffalo and the U.S. Gulf Coast) landed in these markets. This indicates there is a clear connection between the Toronto and Montreal markets and international markets for regular leaded and unleaded gasoline;

(g) excess capacity presently exists in two of the main product pipelines serving Western New York, and in terminal capacity in U.S. points contiguous with Central Canada;

(h) this interconnection between markets would prevent any domestic producer from setting the wholesale price above competitive levels for any extended period of time without losing market share;

(i) there is some indication that the wholesale market for gasoline in Toronto has become more closely integrated with the Buffalo wholesale market since deregulation of Canadian oil pricing in 1985; and

(j) market adjustment is a relatively fast process in both markets. For example, in the Toronto market for gasoline, 80% of adjustment in the price occurs within 8 weeks.

24. Therefore, it is reasonable to conclude that the Central Canadian refining industry is not separated from a larger market which includes at least the East Coast, Mid-Atlantic, Mid-West and Gulf Coast of the U.S.A. As noted in paragraph 48 of the Overview, Canada has also received refined products from Algeria, Belgium, France, Italy, Mexico, the Netherlands, Peru, Saudi Arabia, Spain, Trinidad and the United Kingdom. In addition, the East Coast of the U.S.A. is itself integrated into larger markets including the Caribbean and Europe.

25. These conclusions are bolstered by the data on imports and exports. Imports are also extensively discussed in paragraphs 46 to 51 of the Overview. The imports and exports of refined petroleum products between refineries in Central Canada and purchasers in the U.S.A. has greatly expanded since deregulation. Imports of gasoline accounted for 8% of total retail demand in Central Canada in 1988. Moreover, as stated in paragraph 26 of the Statement of Grounds the actual volume of imports is not necessarily a good indicator of the extent of integration between markets. Markets can be integrated, yet little volume is shipped between them if prices are such that importation is unnecessary. It is the potential to import which affects a local refiner's pricing decisions.

C.3 The Director's Concerns

26. The merger does reduce the number of participants in the petroleum refining sector in Central Canada by one and, therefore, could increase the risk of collusion. One of the Director's concerns is that a high degree of vertical integration and increased concentration at the refinery level might increase transparency of integrated refiners' strategies and thus the potential for interdependent behaviour.

27. Further, the Notice of Application states that the Central Canadian gasoline refining and wholesale distribution markets have many participants situated in Central Canada. As noted above, these markets are also open to international competition. Nevertheless, the Director argues that a key to continued competition in both the wholesale and retail gasoline markets is the survival of independent marketers.

28. Therefore, the issues I will consider are as follows:

(a) will the merger lead to an increase in opportunity for interdependent market behaviour among refiner-marketers in Central Canada;

(b) will the supply provisions in the DCO ensure that the creation of a firm with 28% of the effective refining capacity in central Canada will not substantially reduce gasoline supplies available to independent marketers or unreasonably increase the price thereof; and

(c) would an alternative remedy, namely, the divestiture of Nanticoke be a superior remedy?

C.3 The Remedy Incorporated in the DCO

29. The supply obligations of Imperial to independent marketers are set out in paragraphs 20 through 26 of the DCO. In summary, the obligations are:

(a) Imperial will make available up to 1511 million litres of gasoline directly or indirectly from the Sarnia and Nanticoke refineries available at Imperial wholesale supply points in Central Canada for purchase by independent marketers. (This volume is the actual volume supplied to independent marketers in calendar year 1988 from the Sarnia and Nanticoke refineries according to the COIS);

(b) Further, these volumes may increase each year by the percentage growth of gasoline sales in Central Canada subject to a cap of 26.4% of the maximum gasoline output,

directly or indirectly of the Sarnia and Nanticoke refineries which supply includes the increase in output obtainable by virtue of the efficiencies derived from the joint operation of the refineries;

(c) for purchases on an annual basis of at least 20 million litres, the terms will be reasonable commercial terms according to the Imperial standard form supply contract; volumes less than 20 million litres annually can be charged at higher prices reflecting any higher costs; and

(d) these supply obligations extend for 10 years; Imperial is not obliged to enter into supply agreements of less than one year or more than five years, nor to enter into new supply agreements beyond year seven.

C.4 Review of the Remedy

Risk of Interdependent Behaviour

30. Wholesale marketers purchase gasoline from refineries which are located in Central Canada or elsewhere and from terminal operators who obtain product on the Canadian or foreign markets. The degree of competition in the wholesale market depends on the degree of competition at the refinery gate, among terminal operators, and as among wholesale marketers themselves.

31. Given that the Central Canada gasoline refining industry is part of a larger refining market, it is difficult for market power at the wholesale level in Central Canada to be increased by this merger for the following reasons:

An attempt by the merged firm to raise prices or reduce supply at the wholesale level would be undone by the ability of wholesalers to obtain supplies from other sources. As I have already indicated, many refineries sit close to Central Canada. Further, while Imperial will be the largest refiner in Central Canada, it will have 4 other rivals, 2 of which are of nearly similar size. It

is, therefore, reasonable to conclude that the merged firm would not be "dominant" in the refining sector in Central Canada.

32. In assessing the potential for increased interdependent behavior arising from a merger, economists examine supply elasticities to determine if co-ordination can be undone by a seller profitably "cheating" and, how readily alternative suppliers, not acting interdependently, can undo any potential to increase prices by the collusive "group".

33. Entry barriers in constructing a new refinery are clearly large. However, the high fixed costs and the large penalties from low capacity utilization mitigate an individual refiner's desire to reduce output. As the RTPC Report states:

> "The high fixed costs of a refinery of any size creates pressure for individual refiners to maximize capacity utilization and perhaps, to that end, to reduce their product prices. Since most costs other than feedstock are fixed, a refiner can cover the variable costs of additional business while still falling short of recovering the total costs of these additional sales. Furthermore, the costs of closing down and restarting a refinery are so high that it may pay a refiner to make additional sales at prices that are temporarily below variable costs. High percentage of excess

> refining capacity can thus result in price cutting and other methods of trying to increase sales in all markets in which refiners participate." (page 201)

34. In other words, refiners can recognize substantial efficiencies by maximizing their refinery utilization rates. In the words of the RTPC report, these efficiencies "result from the fact that labour and maintenance costs do not rise proportionally as fast as increases in refining capacity" (page 197). Moreover, due to the magnitude of the investment "sunk" in a refinery, Canadian refiners are vulnerable to financial pressure brought on by reduced capacity utilization if they fail to make their production available at competitive prices.

35. A collusive attempt to raise prices (and reduce output) would then burden an individual refiner with higher unit operating costs, and a price well above marginal costs. It would therefore be in the interest of any one refiner to act as a free-rider - to stay outside the collusive group and sell more gasoline.

36. The increasing capacity utilization of Central Canada refineries mitigates the pressures on any one refiner from free-riding. However, the supply response in Central Canada is not simply the change in the output of

Central Canada refineries. One need not construct a new refinery to increase the supply of wholesale gasoline in Central Canada, one need only import gasoline - from Detroit, Buffalo, Toledo, the U.S. Gulf Coast or other sources of gasoline supply close to Central Canada.

37. The elasticity of supply of refined gasoline to Central Canada is, therefore, not low because of concentration in Central Canada, but high for a variety of reasons, principally the economic pressures on any one refinery to sell more gasoline and the integration of Central Canada into a larger refined products market.

38. Finally, the DCO by assuring a continuation of supply to independent gasoline marketers also limits any tendency towards tacit collusion. Tacit collusion among refineries is only useful if it is translated into higher product prices at the retail level. The substantial independent marketer segment helps ensure that increased concentration at the refinery level cannot lead to increased retail prices.

Supply to Independent Marketers

39. While I do not comment directly on the retail sector of the industry, it is clear that the role of independent marketers is viewed as an important competitive element in the DCO.

40. According to paragraph 56 of the Statement of Grounds and paragraph 45 of the Overview, for the year 1988 Imperial and Texaco combined, accounted for about 45% of gasoline supplies to independent marketers in Ontario and about one-third of supplies in Quebec.

41. One potential fear in a merger of this size and scope is that the merged firm would acquire sufficient market power to restrict supplies or raise wholesale prices to independent marketers in an attempt to raise retail gasoline prices.

42. Such a scenario is unlikely in my view, given the ready alternative supplies of gasoline at the wholesale level close to Central Canada (i.e., the high elasticity of supply of gasoline to Central Canada). Nevertheless

when two active and large suppliers of wholesale gasoline to independent marketers merge, there is at least a perception of potential anti-competitive effects.

43. The DCO ensures that the merged firm cannot exercise any new market power over independent marketers by reducing supply (market power which in my view does not exist) by providing that the present level of supply to independent marketers will continue for 10 years at reasonable prices. The questions here are whether the term is sufficiently long and whether the imposition of reasonable commercial terms which I take to include price, ensures competitive supply at "reasonable" prices.

44. A ten year term is sufficiently long to allow independents to (a) become established in the market if they are not already present, i.e. it is an assist to entry; and (b) have time to arrange for alternative supplies if that should prove to be necessary. Possibilities with regard to the latter issue include: long term import contracts; joint ventures on a new refinery 10 years in the future; processing agreements with local or foreign refiners, obtaining terminalling facilities, etc. The point is that 10 years gives any prospective competitor a lot of time to make alternative arrangements.

45. The primary assurance that the prices charged by Imperial to independent marketers will be "competitive" is the nature of competition in the refining and wholesale market already discussed. First, imports assure competitiveness. Central Canada is an extension of the Eastern U.S. refining and wholesale gasoline markets. A second assurance is that 4 other firms operate refineries in Central Canada. A third assurance is that sales to independent marketers constitute a significant portion of Imperial's total sales. This means it would be unlikely that Imperial would find it in its interest to shed a large portion of its sales to independent marketers. This need to sell a substantial volume of gasoline, together with prohibitions on price discrimination in the Competition Act, provide assurance that wholesale pricing will remain competitive.

46. Yet another assurance is provided by the provisions of the DCO. Imperial is to supply 1511 million litres; it will not be satisfactory conduct (the Director may in certain circumstances apply for a variation in the order pursuant to paragraphs 28 and 29 of the DCO.) for Imperial to set the price so that it cannot sell 1511 million litres.

47. It would be impracticable in my opinion to attempt to substitute some formula for price determination for the phrase "reasonable commercial terms" in the DCO. The market moves too fast for that to work, with the result being that the price would either be too low and Imperial would be swamped with demands it could not fill; or the price would be too high and demand would dry up altogether. Moreover, refineries are complex, highly capital-intensive assets producing volumes of a set of joint products - gasoline, fuel oil, aviation fuel, residual etc. There is no necessary relationship between the price of any one refined petroleum product and crude oil prices; in aggregate, all refined products must cover the cost of crude and in the long-run the cost of the refinery as well. Tying the price of one product to, say crude oil price, would ensure non-competitive prices at some point.

48. Any pricing formula would also have to take into account the length of any supply contracts. The DCO envisions contracts of durations up to five years. This gives independent-marketers the flexibility to buy short term supplies in anticipation of accessing less expensive supplies in the future or to buy over the long term and alleviate any risk of supply shortages leading to price increases. One would expect a price differential between

the two purchasing scenarios by virtue of the different risks assumed by the parties. A pricing formulation which didn't take into account the different risks would unduly favour long term over short term purchasers or vice versa.

The Appropriate Remedy

49. In considering the remedy provided for in the DCO, the Director has, appropriately, considered refinery capacity constraints in the region. In paragraph 30 of the Statement of Grounds, the Director states "[i]n summary, where the import option operates freely (as it does in Central Canada), and domestic refiners have excess capacity, domestic prices track offshore wholesale gasoline prices. This ensures a viable independent marketing presence."

50. In the Statement of Grounds in paragraph 61, the Director notes that the refinery utilization rate in Central Canada has been increasing from a low in 1982 of 78.4% and 70.7% in Quebec and Ontario respectively to a rate of 87% in 1988. The Director states that "utilization rates will continue to climb as gasoline demand grows. The regulatory requirement that leaded gasoline be phased out by 1990 increases the demand for natural octane gasoline components which in turn places a

strain on gasoline capacity." This slow attenuation in excess capacity in Central Canada is of concern as the industry may reach full capacity utilization in a few years.

51. However, all this means is that, regardless of the merger, the marginal refiner for the Central Canadian market will be located outside Central Canada.

52. The divestiture of Nanticoke is not warranted on anti-competitive grounds for the following reasons:

(a) The merger does not create a dominant firm in the refining or wholesale gasoline market;

(b) The merger does not increase the potential for collusion in the refining or wholesale gasoline markets. After this merger five separate firms will be operating nine refineries in the region. Numerous refineries and terminals capable of handling gasoline are situated close to the market; i.e., the supply elasticity of gasoline to serve Central Canada is large;

(c) The merger leads to real efficiencies in the joint operation of the Nanticoke and Sarnia refineries, efficiencies not otherwise obtainable. By virtue of these efficiencies, the Director found that new gasoline supplies could be made available in Canada;

(d) The divestiture of Nanticoke would not necessarily have assured supply to the independent marketers. To the extent there is excess capacity in the industry, Imperial can obtain substantial gains by selling additional amounts to independent marketers at market prices. This incentive exists irrespective of the merger. To the extent there is no excess capacity, the domestic wholesale price will rise to a level such that demand equals domestic supply or the import price, whichever is lower. Thus, the market's pricing mechanism will not be altered by the merger; and

(e) The supply arrangements contained in the DCO are an effective remedy to ensure that independent marketers are given continued

supply at market prices. In fact, this assurance of supply is far greater than any supply assurance that existed before the merger. Divestiture would not help independent marketers in a sellers' market if access to imports were to be cut off for some reason. The DCO will, as it will require Imperial to set aside a significant portion of its refining capacity for sales to independents.

Terminals

53. IOL is to divest terminals in nine locations in Central and Western Canada. In two of these locations (Calgary, Baie Comeau), Imperial would have had over 60% of the annual industry volume at that location without there being at least two other terminals owned by unrelated companies.

54. The DCO recognizes that there are barriers to entry into and exit from the terminalling sector by virtue of the investment required in building a terminal and environmental regulations which may limit the number of available suitable sites. As a result, where the merged firm has 60% of terminal capacity in a region and where at

least 2 other terminal operators are not present, IOL must divest a terminal. If a purchaser cannot be found for any of the terminals to be divested for efficiency reasons, Imperial, on consent of the Director, may close or dismantle such terminals.

55. These divestments in the terminal sector are reasonable and alleviate any anti-competitive concern of the merger in that sector. Moreover, if any of the terminals is purchased by an independent with access to imports, this could be a significant competitive impact in the vicinity of the terminal as explained in paragraph 32 of the COIS.

E. Efficiencies

56. According to paragraphs 85-89 of the COIS, Imperial will benefit from the following efficiencies as a result of the transaction:

(i) it will distribute approximately the same amount of refined products using fewer terminals by increasing the capacity utilization rate of its remaining terminals;

(ii) it will be able to reduce the level of inventories from the level held by Imperial and Texaco separately prior to the transaction;

(iii) it will make more efficient use of the Sarnia and Nanticoke refineries by virtue of product specialization. This will increase output and reduce investment that would otherwise have been required at Sarnia; and

(iv) Imperial will also benefit from the reduction of overhead expenses.

57. These efficiencies are of the type which commonly occur as a result of a merger of two firms in the same industry. Distributing the same output through an integrated channel as opposed to two separate channels will often lead to reduction in fixed costs per unit of production for distribution. Also, emergency inventory reserved for an integrated enterprise will often be less than that for two separate businesses. Finally, the efficiencies that can be derived from product specialization of manufacturing facilities are well known in the economic literature.

58. Consequently, while I do not know of the potential magnitude of the efficiency gains that Imperial will obtain as a result of the merger and which are enumerated in the COIS, I do think it highly probable that Imperial will experience efficiency gains of this type.

Appendix 1

The Wholesale Market for Leaded and Unleaded Gasoline in Toronto and Montreal

The Relation Between Domestic and Import Prices

by

David L. Dorenfeld
Manager, Economic Studies and Outlook
Operations Planning & Coordination Department

IMPERIAL OIL LIMITED

July 20, 1989

In this study we examine two wholesale markets, Toronto and Montreal, for leaded and unleaded gasoline in order to determine whether the markets for these products in these two areas can be regarded as part of a larger international market. In particular, we examine how the rack prices charged by Imperial Oil are affected by changes in the Buffalo and Gulf Coast rack prices, and whether domestic and international prices tend to be equalized. This process would work through changes in demand for domestically produced gasoline at the wholesale level in response to differences between the domestic wholesale price and the landed import cost of gasoline. The process of price equalization does not require large volumes of imports to be effective. In a well-functioning market, the threat of potential competition may be sufficient to ensure that prices are equalized between trading areas within a single market, even if actual flows between the areas are not large.

A product or commodity that is sold in two geographic regions can be said to be sold in the same economic market if there is a tendency for the price to be equalized between the two geographic regions. For this process to occur, it must be possible for product to flow between the two areas. Markets can be separated either by physical barriers, by transportation costs, or by institutional barriers, such as quotas or other trade barriers. In the absence of artificial trade barriers, the price in one area should be related to the price in the other area by the unit cost of transporting the product from one area to the other, i.e.

(1) $P_i = a(t) + P_j$, that is

the price of the product in region i (P_i) is equal to unit transport costs (a(t)) plus the price of the product in region j (P_j).

One possible form of a relationship between prices in the two regions is represented by a simple linear model, of the form:

$$(2) \qquad P_i = a + b * P_j + e,$$

where a is an ex-ante estimate of unit transport costs (assumed here to be a constant), b is the estimated degree of correspondence between the prices in the two regions, and e is an error term that captures all of the other factors that have not been taken into account. Equation (2) can be interpreted as confirming the validity of Equation (1) if the statistical fit of the equation is good and if the estimate of coefficient b is close to unity.

The simple linear model is an extreme representation of the hypothesis of the closeness of markets. It assumes, since we are working with weekly data, that equalization of prices between the two regions is completed within a week's time. While the degree of integration between the international market and the Canadian market may be high, it is unlikely that these markets will be in continuous equilibrium as is the case, for example, for many financial markets.

The assumption of instantaneous adjustment in Equations (1) and (2) can be relaxed by allowing price adjustment to occur over a longer period of time.

We redefine (1) to determine the long run relationship between the equilibrium price in region i (after full adjustment has occurred) and P_j, the price in region j.

(3) $P_i^e = a(t) + P_j$, where

P_i^e is the equilibrium price in region i corresponding to a price level P_j in region j at time t. The equilibrium price will be achieved in region i at some time after time t, (provided of course that in the interim the price in region j does not change).

The second part of the partial adjustment model is to define the way in which the price in region i changes in response to a deviation of the actual price from the equilibrium price. We will assume that in each period the actual price moves in the direction of the equilibrium price at a rate that is proportional to the size of the deviation, i.e.

(4) $P_i - P_i(-1) = b * [P_i^e - P_i(-1)] , \quad 0 < b < 1$

where $P_i(-1)$ denotes the price in region i during the previous period and b denotes the speed at which adjustment occurs. Substituting Equation (3) for P_i^e in (4), and rearranging terms, results in an equation that summarizes the partial adjustment model:

(5) $P_i = a*b + b*P_j + (1-b)*P_i(-1)$ + error term

Equation (5) can be estimated and its validity judged on the

basis of the goodness of the overall statistical fit and to the extent that the statistical estimates of the coefficients satisfy the hypothesized constraint:

$$(6) \qquad b + (1-b) = 1$$

namely, after full adjustment has occurred, the price in market i is equal to the price in market j (except for the constant term). Where transport costs between markets j and i are <u>included</u> in P_j, the constant term reflects the average absolute difference in prices after adjusting for transport costs.

Data

The leaded gasoline price data for this study are presented in Figures 1 and 2 below. These charts compare the relevant import price to the Esso rack price for regular leaded gasoline in Toronto and Montreal. Domestic price data are Esso rack prices, measured on Friday morning of each week from July 1, 1985 through August 25, 1988. Altogether there are 166 observations. Import prices are taken from the Oil Price Information Service (OPIS). For the Toronto region, these prices are the contemporaneous Buffalo rack price of regular leaded gasoline, FOB Buffalo, converted to Canadian dollars, plus an allowance for transportation costs -- 1.2 cents per litre for leaded gasoline. Note that underestimating these transport costs will lead to a positive measured intercept [$a > 0$] in equation 5. For the Montreal region, the import price is the

average of bid and asked spot prices on the U.S. Gulf Coast two weeks earlier plus an allowance for marine transport and terminal charges. Prior to 1987, transport costs to Montreal from the Gulf were estimated to be a constant 1¢ per litre. Since 1987, these costs are calculated weekly based on spot charter rates for clean product. The two week lag is an allowance for average transportation time between the Gulf and Montreal.

Correlations

The general relationship between import prices and the domestic rack price for leaded gasoline in the two markets can be seen in Figures 3 and 4, which plot scatter diagrams of the import price against the domestic price in each of the two markets. What is most interesting about these figures is that they show two distinct clusters of relations, one at relatively high prices before the 1986 oil price collapse and one for the period since that time. In both markets, the relationship between the rack prices show a distinct "counterclockwise" pattern during the price collapse of 1986, which reflects a slower rate of adjustment of the Canadian prices at that time. This lagging pattern of the Canadian prices behind the foreign prices is a key result that will be discussed in detail below.

It is clear from the scatter diagrams that there is a strong correlation between prices in the two markets. The question then is how good is this correlation; and, in particular, is it good enough

to support the belief that the Toronto and Montreal markets for this product are effectively part of the international market?

Results

Table 1 shows estimates of the partial adjustment model fitted to data for leaded gasoline. This model includes the lagged value of the dependent variable on the right-hand-side of the equation. The underlying hypothesis of this model is that the sum of the coefficients of the import variable and the lagged dependent variable is unity. A high value on the lagged dependent variable implies that a large proportion of the adjustment of the market occurs after the first week.

As is evident from the R-squared statistic, the fit of this model is extremely good. There is no evidence of serial correlation, since in both regions the Durbin h statistic is comfortably in the range for which serial correlation can be rejected. For the Montreal market, the sum of the estimated coefficients b + (1-b) is not statistically different from one, indicating that the maintained hypothesis holds, i.e. that Montreal and the U.S. Gulf Coast wholesale markets are interconnected. For the Toronto market, the sum of b + (1-b) is close to but not necessarily unity (0.97 is significantly less than 1 in the statistical sense of the term). We re-analyze this data in the next section to take account of the deregulation which occurred in 1985. When we do so, the sum of the coefficients on the import price and

on the lagged dependent variable is estimated to be unity in the period since late 1985.

The constant term is not significantly different from zero in Montreal, but positive and significantly different from zero in Toronto (a result which also changes when we try to account for the impact of deregulation).

Test for Stability of the Estimated Coefficients

One factor that needs to be taken into account is that our sample begins immediately after the deregulation of energy pricing in Canada in the summer of 1985. As a result, much of the infrastructure for trade in these products began to be established during the course of the first year or so of our sample. There is a possibility, therefore, that the estimated coefficients of the partial adjustment model may constitute an average of a changing import process rather than an estimate of a stable, established system. In order to test this hypothesis, each of the equations was estimated separately for the first and second halves of the sample period (the first period runs from July 1985 through December 1986). The resulting estimates were then tested against the null hypothesis that there had been no change in the coefficients. Results are presented in Table 2. The first equation in each group reproduces the results reported in Table 1. The second two equations show the results when the same equation is estimated separately over the first and second half of the sample.

The fit of all the re-estimated equations is generally good, though the adjusted R^2 tends to be slightly lower for the second half of the sample than for the first. None of the re-estimated equations exhibits serial correlation. Most interesting, however, the only market that appears to have undergone a statistically significant structural change during the sample period is the market in Toronto.

In Table 1 the estimates for the Toronto market indicate that the sum of the estimated coefficients of b and 1-b is less than unity (0.97) and that the constant term is greater than zero. However, when the equation is re-estimated separately for each half of the sample period, the value of the Chow Test F statistic (5.23) is well within the critical region of the test, indicating that the coefficients of the two equations have changed over time. Moreover, for each half of the sample the constant terms are <u>not significantly different from zero</u>. Another interesting fact is that the point estimate of the import price coefficient (0.18) in the second half of the sample is noticeably larger than the full sample coefficient (0.13). This corresponds to a reduction in the mean lag from 7.7 weeks to 5.6 weeks. Finally, in the second half of the sample the sum of the import and lagged dependent variable coefficients is not significantly different from unity.

These results tend to confirm observations made by people in the industry that the link between the Buffalo and Toronto markets has been growing closer during the past few years.

Based on the evidence from Table 2 we will use estimates from the second half of the sample as representative of the current relationship between the Toronto and Buffalo wholesale gasoline markets. For the Montreal market, we will use the full sample estimates*.

For both Toronto and Montreal we can conclude that:

(1) the constant term is not significantly different from zero. This implies that there is no statistically significant difference in rack prices between these markets which is not accounted for by transport costs.

(2) the measured 'degree of integration' between the two markets is not significantly different from one. A change in the import rack price is, in time, fully reflected in the Esso rack price.

(3) adjustments in prices are rapid. The mean or average lag [1/b] is 5.6 weeks in Toronto and 11 weeks in Montreal. The latter is reduced to 8 weeks after adjustment for seasonality is taken into account.

* Dividing the period into two did not yield statistically different results between sample periods for the Montreal market.

Seasonality

Because our estimates are based on weekly data, it is important to eliminate any seasonal influences that could lead to biased estimates of the key parameters. In order to test for seasonality, the partial adjustment model for both markets for leaded gasoline was re-estimated, with seasonal dummy variables added as regressors. Table 3 summarizes the results of these estimates for the Toronto and Montreal markets. There is no evidence of seasonality in leaded gasoline prices in Toronto, as each of the quarterly dummy variables is not significantly different from zero. There is, however, strong evidence of seasonality in the leaded gasoline data for Montreal.

One effect of seasonal adjustment of the equation for leaded gasoline in Montreal is that it appears to produce a positive constant term. In this equation, however, the constant term is the sum of a seasonally adjusted constant term and the seasonal factor for the first quarter. Table 4 summarizes a test to determine whether the seasonally adjusted constant term is equal to zero. The hypothesis that the seasonally adjusted constant term is zero is accepted in both Toronto and Montreal.

The most significant change in the original model estimates that arises from seasonal adjustment is an increase in the estimated adjustment speed for leaded gasoline in the Montreal market. Here the mean lag for leaded gasoline imports is shortened from 11 weeks to about 8 weeks. The difference between this time and the 5.6 week

lag for Toronto is most likely due to the higher inventory requirements in the Montreal market.

Unleaded Gasoline

The Toronto and Montreal wholesale markets for gasoline were re-examined to determine whether the statistical results for leaded gasoline also apply to unleaded gasoline. If the statistical results do not vary significantly between the two products, we may then draw similar conclusions for the wholesale markets for unleaded gasoline.

The data source for this study is unchanged. However, data for the wholesale import prices for unleaded gasoline from Buffalo and the U.S. Gulf Coast are not available prior to September, 1986. Consequently, for unleaded gasoline our estimates are based on data for the second half of the sample period. This period covers the time between January 1987 and August 1988.

Estimates of this model, fitted for regular unleaded gasoline, are shown in Table 5. The table includes both the original form and seasonally adjusted form of the estimated equations. For both markets, the results do not differ significantly between the two product types (compare Table 5 and Table 3). Also of note, the unleaded gasoline data for Toronto, as was the case with leaded fuel, does not exhibit any seasonal patterns as each of the seasonal dummy variables is not statistically different from zero. For both

fuel types, the constant term is not significantly different from zero, and the sum of the coefficients on the import price and lagged dependent variable is not significantly different from unity. Both the leaded and unleaded equations have similar R-squared values of 0.94 and 0.93, respectively.

In the case of Montreal, the same equation fitted for both fuel types also does not yield significantly different results. Unleaded gasoline, as was the case with leaded fuel, exhibits seasonality (non-zero coefficient for third quarter dummy variable), though the pattern is somewhat different for the two fuels. The sum of the import price and lagged dependent variable coefficients for leaded and unleaded gasoline does not differ significantly from one. The goodness of fit is quite high for both Montreal equations with R-squared values of 0.92 and 0.99. Finally, Table 6 summarizes the results of a test of the constant term, indicating that the seasonally adjusted constant term for unleaded gasoline is not significantly different from zero.

Price Adjustment -- Timing

In order to study the speed of adjustment question more closely, it is necessary to have equations that conform exactly to the theoretical model, which requires a constant term of zero. Since both of the estimated constant terms are not significantly different from zero, the original equations for Toronto and the

seasonally adjusted Montreal equations (from Tables 3 and 5) were re-estimated with the constant term suppressed. The results are shown in Table 7. The fit of the equations is extremely good with an adjusted R^2 of between 0.92 and 0.99. For the Toronto market, the sum of the estimated coefficients is in each case almost exactly unity, measured to two significant digits. For the Montreal market, the sum of the coefficients is not significantly different from unity. For the purpose of simulation, we assumed a value of 0.12 for the import price coefficient and 0.88 for the lagged dependent variable.

Using these coefficients, each equation was simulated to examine the response of the domestic rack price in both markets to a two cent change in the relevant import price. The results for leaded gasoline are plotted on Figure 5 which shows the percentage of the price gap that will be closed over a period ranging from 1 to 26 weeks. The fastest response is in the Toronto market, where almost 80% of the leaded gasoline price gap is closed within 8 weeks and 50% between 3 and 4 weeks. In Montreal the response is slower, with 50% of the gap closed between 5 and 6 weeks and 75% in 11 weeks. The adjustment process is almost identical for unleaded fuel.

In-sample Simulation

The goodness of fit of the partial adjustment model can also be evaluated by examining a simulation of the actual prices against the prices estimated as the fitted values of the leaded gasoline

equations in Table 3. We use the seasonally adjusted equation for Montreal. Figures 6 and 7 plot the fitted and actual values for both of these equations. This fit is a so-called "static" simulation, meaning that each fitted value is a one period ahead forecast that makes use of the actual lagged value. In other words, the fitted equation is estimating the weekly change in the domestic price, given knowledge of the actual value in the previous week and the relevant "current" price in either Buffalo or the Gulf Coast. These simulations confirm the tight statistical fit of the unconstrained equations. In both markets the estimated value tracks the actual value very closely.

Causality

One question that may arise in the interpretation of statistical results like these is that of causality. This question is legitimate because regression analysis does not imply any causal relation between the independent and dependent variables. For example, if we reversed the role of domestic and import prices in these models we would find equally persuasive evidence of correlation. The case for causality running from the world market to the Canadian markets does not rest on statistical evidence presented here but on a prior belief that it is highly unlikely that the price of products at either the U.S. Gulf Coast or New York harbour will be determined by Canadian export or import behavior. The exogeneity of the international price is a prior assumption of our analysis.

Conclusions

The above analysis suggests the following conclusions:

- There is a strong positive relationship between the wholesale price of leaded and unleaded gasoline in the regional markets of Toronto and Montreal and corresponding wholesale prices of imports landed in these markets.

- The fit and statistical constraints implied by the partial adjustment model demonstrates a high degree of conformity to this model and therefore:

- There is a clear connection between the Toronto and Montreal markets and international markets for regular leaded and unleaded gasoline.

- This interconnection between markets would prevent any domestic producer from setting the price above competitive levels for any extended period of time without losing market share.

- There is some indication that the market for motor gasoline in Toronto has become more closely integrated with the Buffalo wholesale market since deregulation of Canadian oil pricing in 1985.

- Market adjustment is a relatively fast process in both markets. The fastest adjustment occurs in the Toronto market for motor gasoline, where about 80% of adjustment is complete within 8 weeks. Between five and six weeks after a change in the wholesale price in the Gulf Coast, 50% of the change is fully reflected in Esso's Montreal rack price.

- The time lag of the partial adjustment model is symmetrical; upward price adjustments in the international market will take equally long to be reflected in the domestic market. This phenomenon is clearly visible in the data (Figure 1) which includes long runs both above and below the Buffalo rack price.

Supplementary Issues

a) **Extended Sample Period**

The original analysis on wholesale gasoline markets was conducted in the Fall of 1988 and covered the July 1985 to August 1988 period. During the course of discussions with the Bureau of Competition Policy the analysis was updated for a sample period extending to February 24, 1989. This brings the total number of weekly observations up to 192 from 166.

The original results of the study continue to hold for the extended sample period. Tables A-1 and A-2 compare estimates of the model using the original and augmented sample. The sample period for leaded and unleaded gasoline in Toronto and unleaded gasoline in Montreal begins in January 1987. For leaded gasoline in Montreal, the sample size covers the full period back to July 1985. The Montreal equations are corrected for seasonality, although the seasonal dummy variables are not shown in the table. The coefficients do not show any statistically significant changes for either Toronto or Montreal. The only change in both cases is reflected in the constant term, which remains insignificantly different from zero.

b) Product Versus Crude Oil Prices

There is no question that there is a strong relationship between domestic wholesale gasoline prices and imported prices. One question that arises, however, is whether this correlation may be due to the fact that prices in both areas are related to crude oil prices. While it is of course true that all petroleum product prices are necessarily related to crude oil prices, and hence, to each other, the issue here is not this long-run relationship but the short-run relationship. The question is whether over short time horizons, such as a few weeks, the relationship between product prices is stronger or weaker than between product and crude oil prices.

Table B-1 shows the relationship between domestic and imported prices for Toronto and Montreal. In the Toronto market analysis, Canadian light par (at Edmonton) crude is used to determine price relationships while the Brent spot crude price (fob Sullom Voe) is used for Montreal. For Toronto there appears to be a much stronger short-run relationship between product prices than between product and crude oil prices. For Montreal, this relationship holds up for leaded gasoline, though the difference is less striking. For unleaded gasoline, prices appear to be more closely tied to crude than to import product prices.

c) Transaction Prices

An argument could be made that rack prices for gasoline are purely benchmarks and do not represent a true market price. If a transaction price for gasoline was used instead of domestic rack prices, the price relationships established earlier might not hold.

To examine this issue, the transaction price -- that is, the actual price paid by one customer (a large independent reseller) -- was used in place of the Toronto rack price for gasoline. As shown in Table C-1, replacing the rack price for leaded and unleaded gasoline with a transaction price in Toronto -- the only market where we have suitable data -- does not affect any of the earlier conclusions.

TABLE 1

PARTIAL ADJUSTMENT MODEL: REGULAR LEADED GASOLINE

Dependent Variables:	Independent Variables:			Evaluation Statistics:		
	Constant (a)	Import Price (b)	Lagged Dependent Variable (1-b)	Sum (b+(1-b))	Adjusted R^2	Durbin h Statistic
Toronto Rack Price Jul. '85 - Aug. '88	0.50 (0.21)	0.13 (0.02)	0.84 (0.02)	0.97 (0.01)	0.99	0.56
Montreal Rack Price Jul. '85 - Aug. '88	0.20 (0.19)	0.09 (0.02)	0.91 (0.02)	0.99 (0.01)	0.99	0.61

Note: Import Prices — Toronto - Buffalo Rack Price
Montreal - U.S. Gulf Coast Import Price

Domestic Prices — Esso Rack Price

A Durbin h Statistic > 1.645 suggests first-order serial correlation at the 5% level of significance.

TABLE 2

STABILITY TEST: PARTIAL ADJUSTMENT MODEL

	Coefficients:					Chow Test*
	Constant	Import Price	Lagged Dependent Variable	R^2	Durbin h Statistic	F =
Toronto - Leaded Gasoline						
Full Sample	0.50	0.13	0.84	0.99	0.56	
1st Half	0.11**	0.15	0.83	0.99	0.23	
2nd Half	0.13**	0.18	0.82	0.94	0.55	5.23
Montreal - Leaded Gasoline						
Full Sample	0.20	0.09	0.91	0.99	0.61	
1st Half	0.08	0.09	0.91	0.99	0.58	
2nd Half	1.10	0.06	0.89	0.86	0.12	0.54

Note: * A critical F statistic > 3.05 suggests possible structural change in the equation.

** The standard error terms for the 1st and 2nd half are 0.29 and 0.62, respectively.

TABLE 3

PARTIAL ADJUSTMENT MODEL: TEST FOR SEASONALITY

TORONTO AND MONTREAL - LEADED GASOLINE

Dependent Variables:	Independent Variables:						Evaluation Statistics:	
				Quarterly Dummies:				
	Constant	Import Price	Lagged Dependent Variable	Q2	Q3	Q4	Adjusted R^2	Durbin 'h' Statistic
Toronto								
Leaded Gasoline Jan. '87 - Aug. '88	0.13 (0.62)	0.18 (0.04)	0.82 (0.04)	--	--	--	0.94	0.55
Leaded Gasoline Jan. '87 - Aug. '88	0.40 (0.95)	0.15 (0.04)	0.83 (0.05)	0.17 (0.12)	0.07 (0.16)	0.08 (0.15)	0.94	0.76
Montreal								
Leaded Gasoline Jul. '85 - Aug. '88	0.20 (0.19)	0.09 (0.02)	0.91 (0.02)	--	--	--	0.99	0.61
Leaded Gasoline Jul. '85 - Aug. '88	0.65 (0.21)	0.12 (0.02)	0.87 (0.02)	-0.47 (0.11)	-0.34 (0.11)	-0.19 (0.11)	0.99	1.40

Note: Import Product Price - Buffalo Rack Price
U.S. Gulf Coast Import Price

A Durbin h Statistic > 1.645 suggests first-order serial correlation at the 5% level of significance.

TABLE 4

PARTIAL ADJUSTMENT MODEL: F-TEST FOR CONSTANT TERM

F - Test:

	Coefficients[a] of Quarterly Dummy Variables and Constant Term Sum to 0
Leaded Gasoline	
Toronto	0.34
Montreal	1.74
$F_{\text{critical}}^{5\%}$	3.84

(a) Test of the hypothesis that the seasonally adjusted constant term is equal to zero.

TABLE 5

PARTIAL ADJUSTMENT MODEL - TORONTO AND MONTREAL

UNLEADED GASOLINE

Dependent Variables:	Independent Variables:						Evaluation Statistics:	
	Constant	Import Price	Lagged Dependent Variable	Quarterly Dummies: Q2	Q3	Q4	Adjusted R^2	Durbin 'h' Statistic
Toronto								
Unleaded Gasoline Jan. '87 - Aug. '88	0.52 (0.66)	0.20 (0.04)	0.79 (0.04)	--	--	--	0.93	0.38
Unleaded Gasoline Jan. '87 - Aug. '88	0.48 (0.88)	0.19 (0.05)	0.80 (0.05)	0.04 (0.11)	0.01 (0.13)	0.01 (0.13)	0.92	0.45
Montreal								
Unleaded Gasoline Jan. '87 - Aug. '88	0.15 (0.75)	0.05 (0.03)	0.94 (0.04)	--	--	--	0.91	0.14
Unleaded Gasoline Jan. '87 - Aug. '88	-0.08 (0.74)	0.12 (0.04)	0.90 (0.04)	-0.16 (0.12)	-0.35 (0.14)	-0.14 (0.13)	0.92	0.60

Note: Import Product Price - Buffalo Rack Price
U.S. Gulf Coast Import Price

A Durbin h Statistic > 1.645 suggests first-order serial correlation at the 5% level of significance.

TABLE 6

PARTIAL ADJUSTMENT MODEL: F-TEST FOR CONSTANT TERM

F - Test:

	Coefficients[a] of Quarterly Dummy Variables and Constant Term Sum to 0
Unleaded Gasoline	
Toronto	0.24
Montreal	0.74
$F_{\text{critical}}^{5\%}$	3.84

(a) Test of the hypothesis that the seasonally adjusted constant term is equal to zero.

TABLE 7

PARTIAL ADJUSTMENT MODEL: CONSTANT TERM SUPPRESSED

	Coefficients:			
	Import Price	Lagged Dependent Variable	Sum of the Coefficients	R^2
Toronto				
Leaded	0.18	0.82	1.003	0.94
Unleaded	0.20	0.81	1.011	0.93
Montreal				
Leaded	0.12	0.87	0.987	0.99
Unleaded	0.12	0.90	1.025	0.92

Note: The sample period for unleaded gasoline in both Toronto and Montreal runs from January 1987 to August 1988. This is also the case for leaded fuel in the Toronto market. For leaded gasoline in Montreal, the sample period covers the full sample, running from July 1985 through to August 1988.

TABLE A-1

PARTIAL ADJUSTMENT MODEL: REGULAR LEADED AND UNLEADED GASOLINE IN TORONTO

[Extended Sample]

Dependent Variables:	Independent Variables:			Evaluation Statistics:		
	Constant (a)	Import Price (b)	Lagged Dependent Variable (1-b)	Sum (b+(1-b))	Adjusted R^2	Durbin h Statistic
Leaded Gasoline						
Jan. '87 - Aug. '88	0.13 (0.62)	0.18 (0.04)	0.82 (0.04)	1.00 (0.03)	0.94	0.55
Jan. '87 - Feb. '89	-0.23 (0.51)	0.17 (0.03)	0.84 (0.03)	1.01 (0.03)	0.94	0.55
Unleaded Gasoline						
Jan. '87 - Aug. '88	0.52 (0.66)	0.20 (0.04)	0.79 (0.04)	0.99 (0.03)	0.93	0.38
Jan. '87 - Feb '89	-0.37 (0.47)	0.19 (0.03)	0.84 (0.03)	1.03 (0.03)	0.95	0.05

Note: Import Prices — Buffalo Rack Price

Domestic Prices — Esso Rack Price

A Durbin h Statistic > 1.645 suggests first-order serial correlation at the 5% level of significance.

TABLE A-2

PARTIAL ADJUSTMENT MODEL: REGULAR LEADED AND UNLEADED GASOLINE IN MONTREAL

[Extended Sample, Seasonally Adjusted Equations]

Dependent Variables:	Independent Variables:			Evaluation Statistics:		
	Constant (a)	Import Price (b)	Lagged Dependent Variable (1-b)	Sum (b+(1-b))	Adjusted R^2	Durbin h Statistic
Leaded Gasoline						
July '85 - Aug. '88	0.65 (0.21)	0.12 (0.02)	0.87 (0.02)	0.99 (0.01)	0.99	1.40
July '85 - Feb. '89	0.54 (0.18)	0.11 (0.02)	0.88 (0.02)	0.99 (0.01)	0.99	1.20
Unleaded Gasoline						
Jan. '87 - Aug. '88	-0.08 (0.74)	0.12 (0.04)	0.90 (0.04)	1.03 (0.03)	0.92	0.60
Jan. '87 - Feb. '89	-0.03 (0.47)	0.07 (0.03)	0.94 (0.03)	1.01 (0.03)	0.96	0.03

Note: Import Prices U.S. Gulf Coast Import Price Landed in Montreal

Domestic Prices Esso Rack

A Durbin h Statistic > 1.645 suggests first-order serial correlation at the 5% level of significance.

TABLE B-1

SIMPLE CORRELATION: GASOLINE AND CRUDE OIL PRICES

	Leaded Gasoline	Unleaded Gasoline
Toronto: Esso Rack		
vs. Buffalo Rack	0.76	0.82
vs. Canadian Light	0.62	0.75
Montreal: Esso Rack		
vs. U.S. Gulf	0.83	0.62
vs. Brent Spot	0.77	0.79

Note: With the exception of the Montreal market for leaded gasoline, the correlation coefficients relate to the January 1987 to February 1989 period. For leaded gasoline in Montreal, the sample period runs from July 1985 through to February 1989.

TABLE 1

PARTIAL ADJUSTMENT MODEL: REGULAR LEADED AND UNLEADED GASOLINE

TRANSACTIONS VS. RACK PRICE - TORONTO

Dependent Variables:	Independent Variables:				Evaluation Statistics:	
	Constant	Import Price	Lagged Transaction Price	Lagged Rack Price	Adjusted R^2	Durbin 'h' Statistic
Leaded Gasoline						
Toronto Rack Price	-0.23 (0.51)	0.17 (0.03)	--	0.84 (0.03)	0.94	0.55
Toronto Transaction Price	-0.63 (0.44)	0.15 (0.03)	0.88 (0.03)	--	0.95	1.18
Unleaded Gasoline						
Toronto Rack Price	-0.37 (0.47)	0.19 (0.03)	--	0.84 (0.03)	0.95	0.05
Toronto Transaction Price	-0.48 (0.38)	0.14 (0.03)	0.88 (0.03)	--	0.96	0.68

Note: Import Product Price: Buffalo Rack Price

Transaction Price: Represents actual price paid to Esso by wholesaler

A Durbin h Statistic > 1.645 suggests first-order serial correlation at the 5% level of significance.

Figure 1

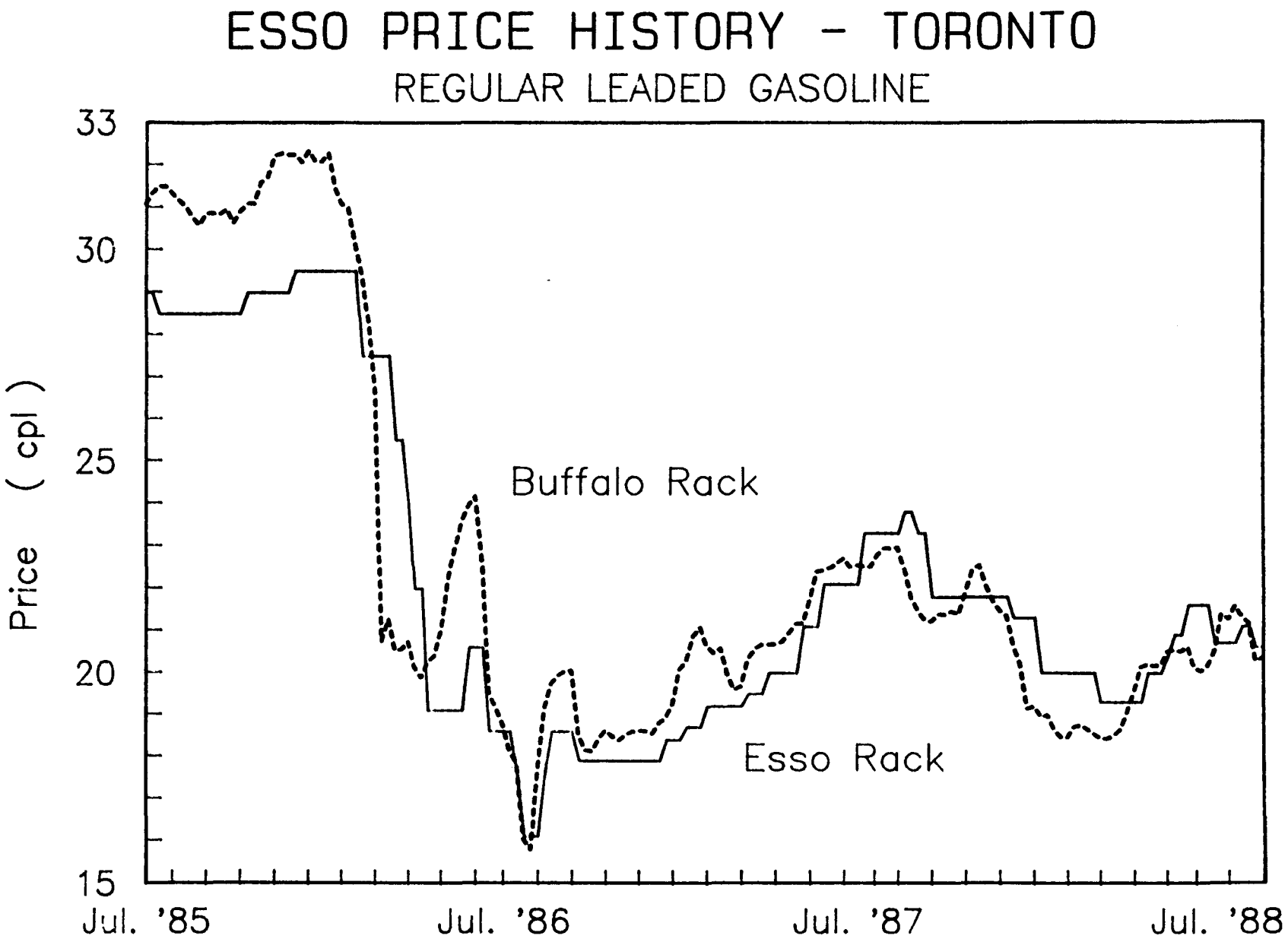

ESSO PRICE HISTORY - TORONTO
REGULAR LEADED GASOLINE
Price (cpl)
33
30
25
20
15
Buffalo Rack
Esso Rack
Jul. '85
Jul. '86
Jul. '87
Jul. '88

Figure 2

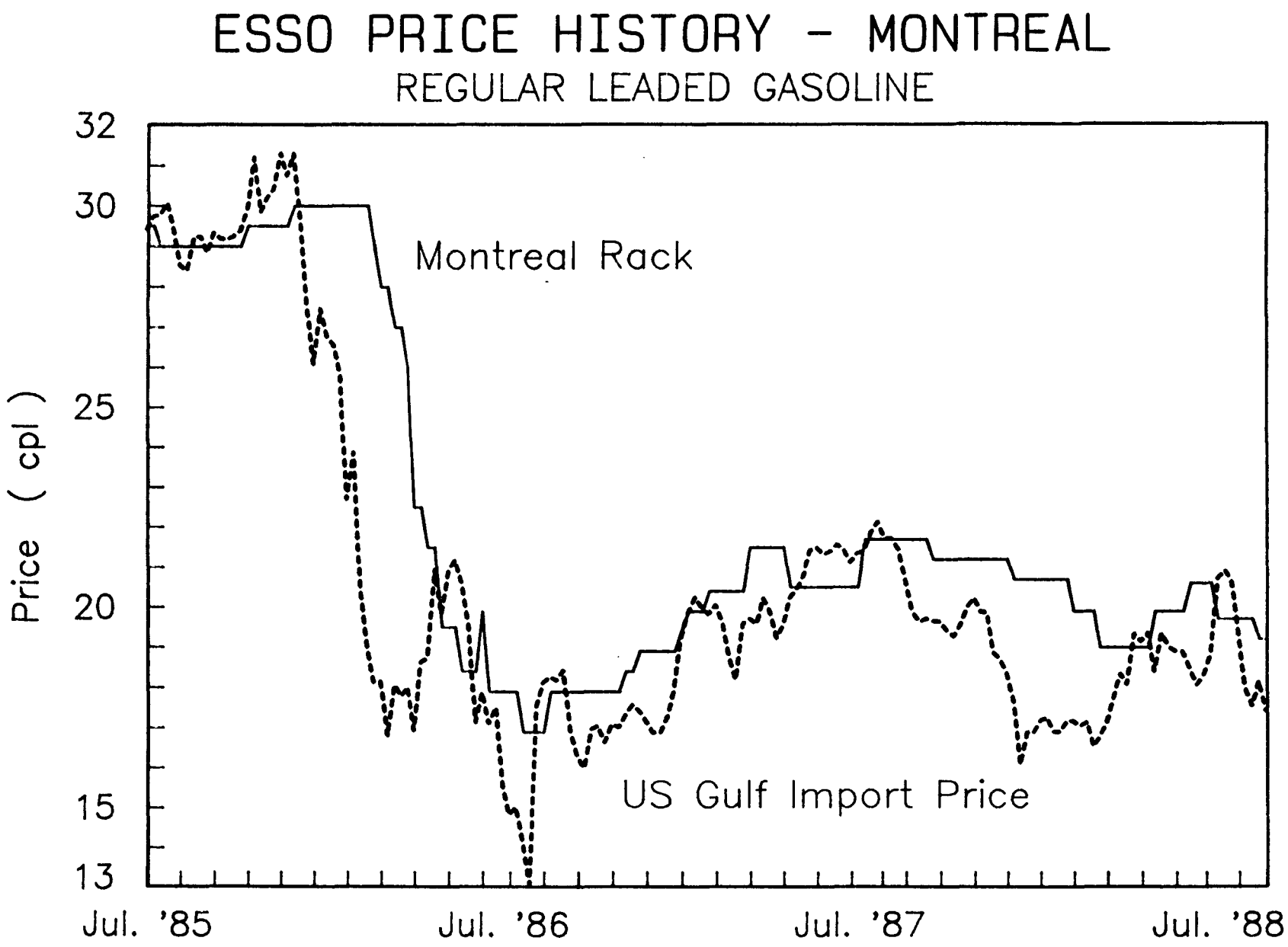

ESSO PRICE HISTORY - MONTREAL
REGULAR LEADED GASOLINE
Price (cpl)
32
30
25
20
15
13
Montreal Rack
US Gulf Import Price
Jul. '85
Jul. '86
Jul. '87
Jul. '88

Figure 3

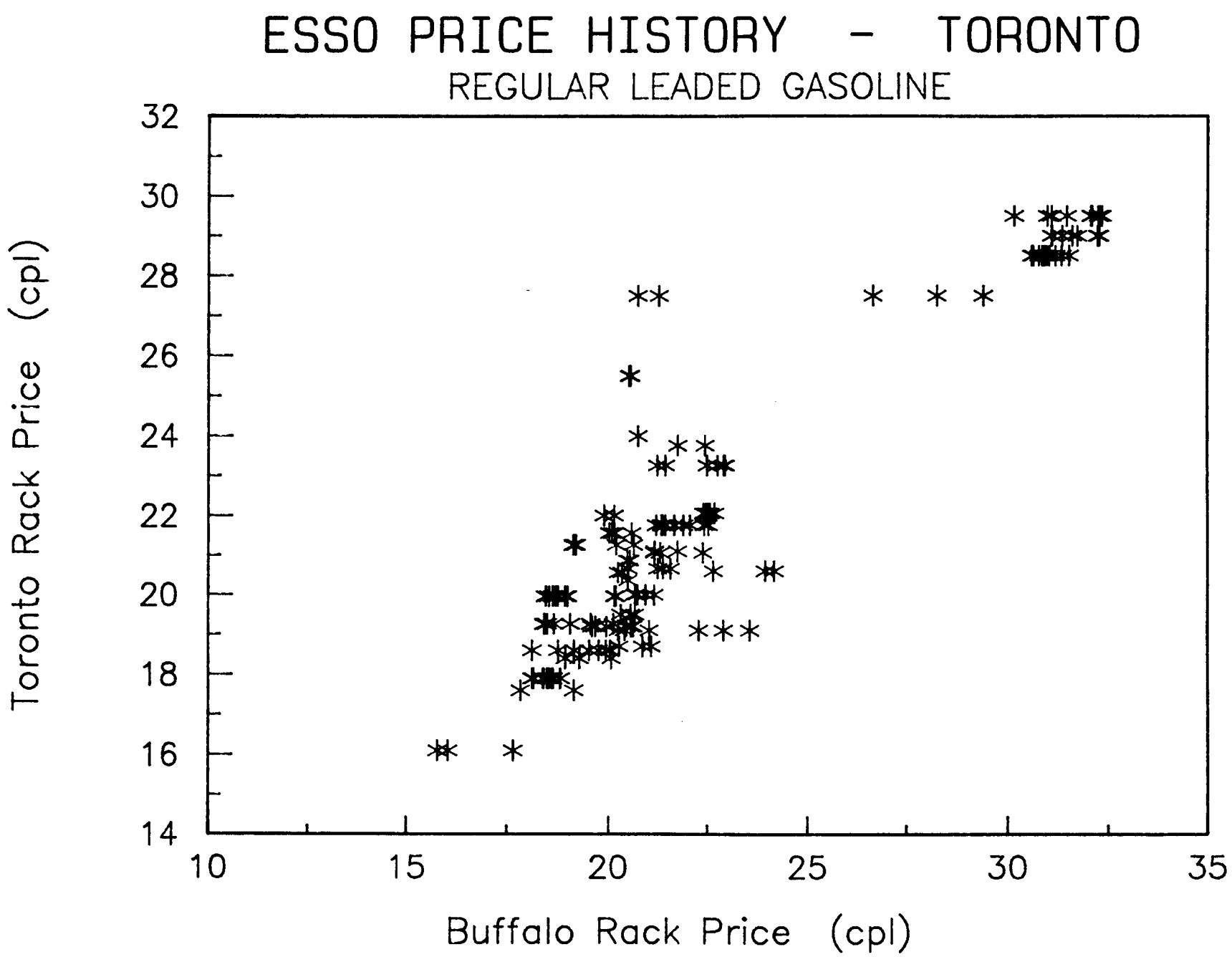

ESSO PRICE HISTORY - TORONTO
REGULAR LEADED GASOLINE
Toronto Rack Price (cpl)
32
30
28
26
24
22
20
18
16
14
10
15
20
25
30
35
Buffalo Rack Price (cpl)

Figure 4

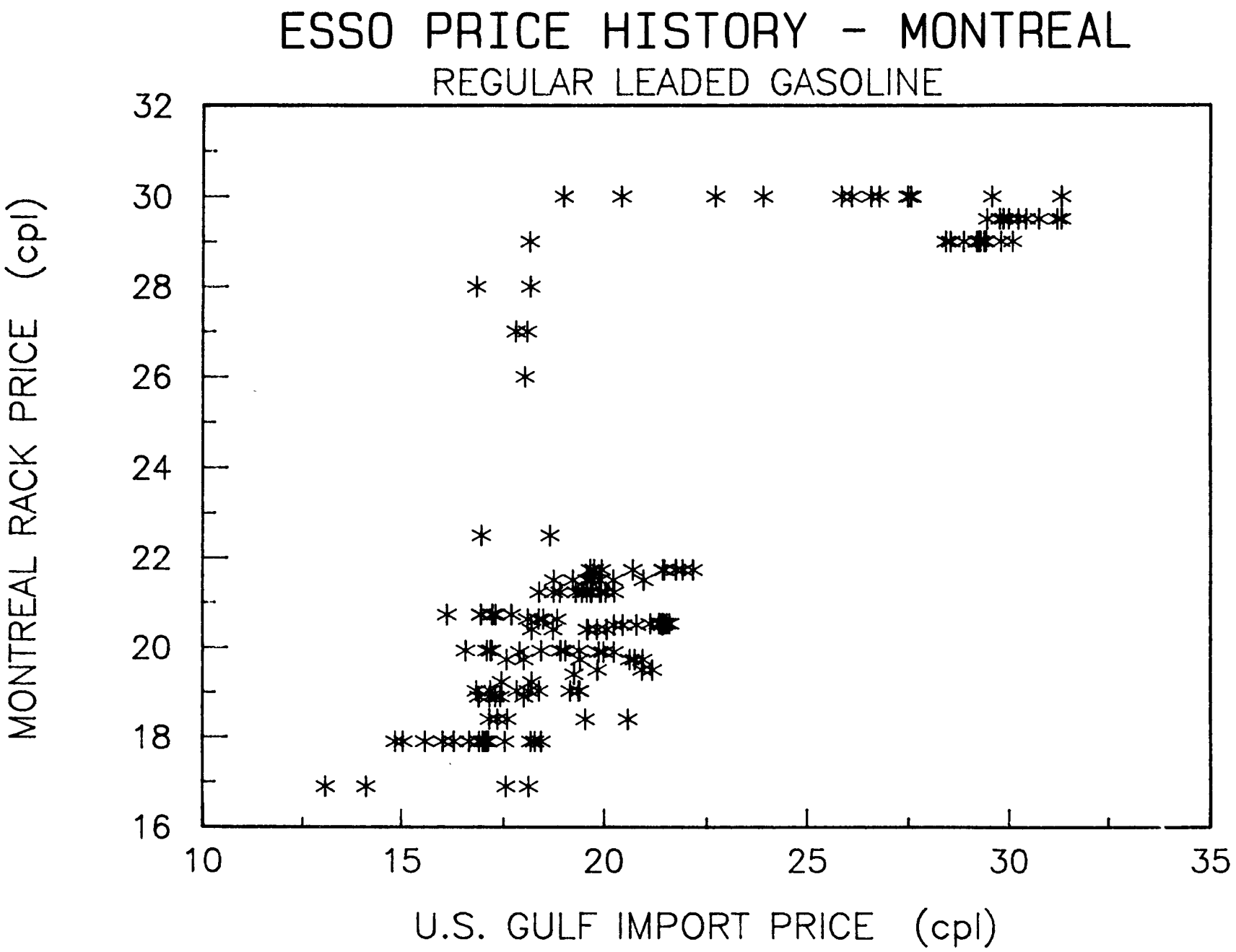

ESSO PRICE HISTORY - MONTREAL
REGULAR LEADED GASOLINE
MONTREAL RACK PRICE (cpl)
32
30
28
26
24
22
20
18
16
10
15
20
25
30
35
U.S. GULF IMPORT PRICE (cpl)

Figure 5

PRICE ADJUSTMENT PROFILE: LEADED GASOLINE

[Relative Change in Rack Price to Import Price Change – %]

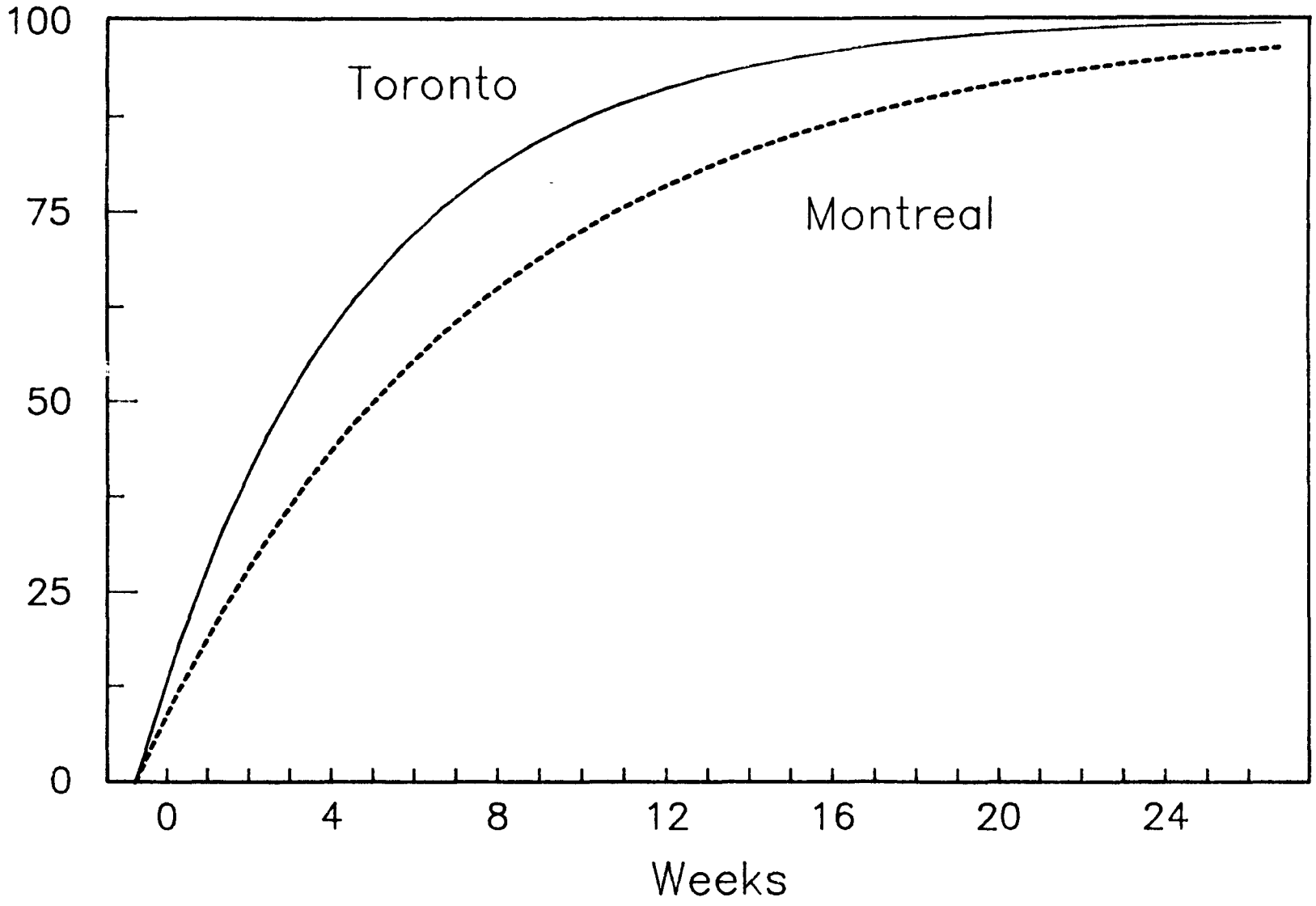


Figure 6

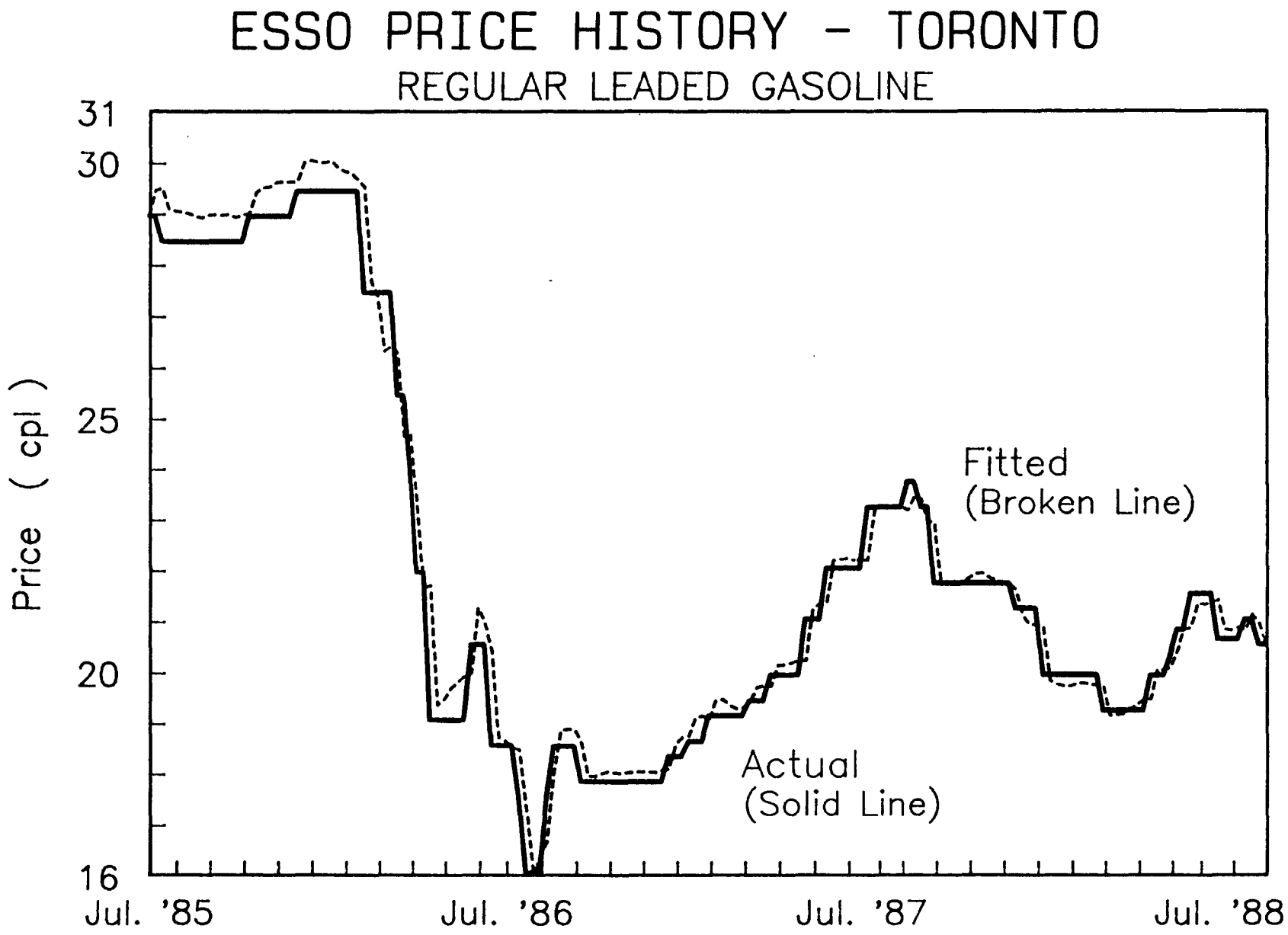
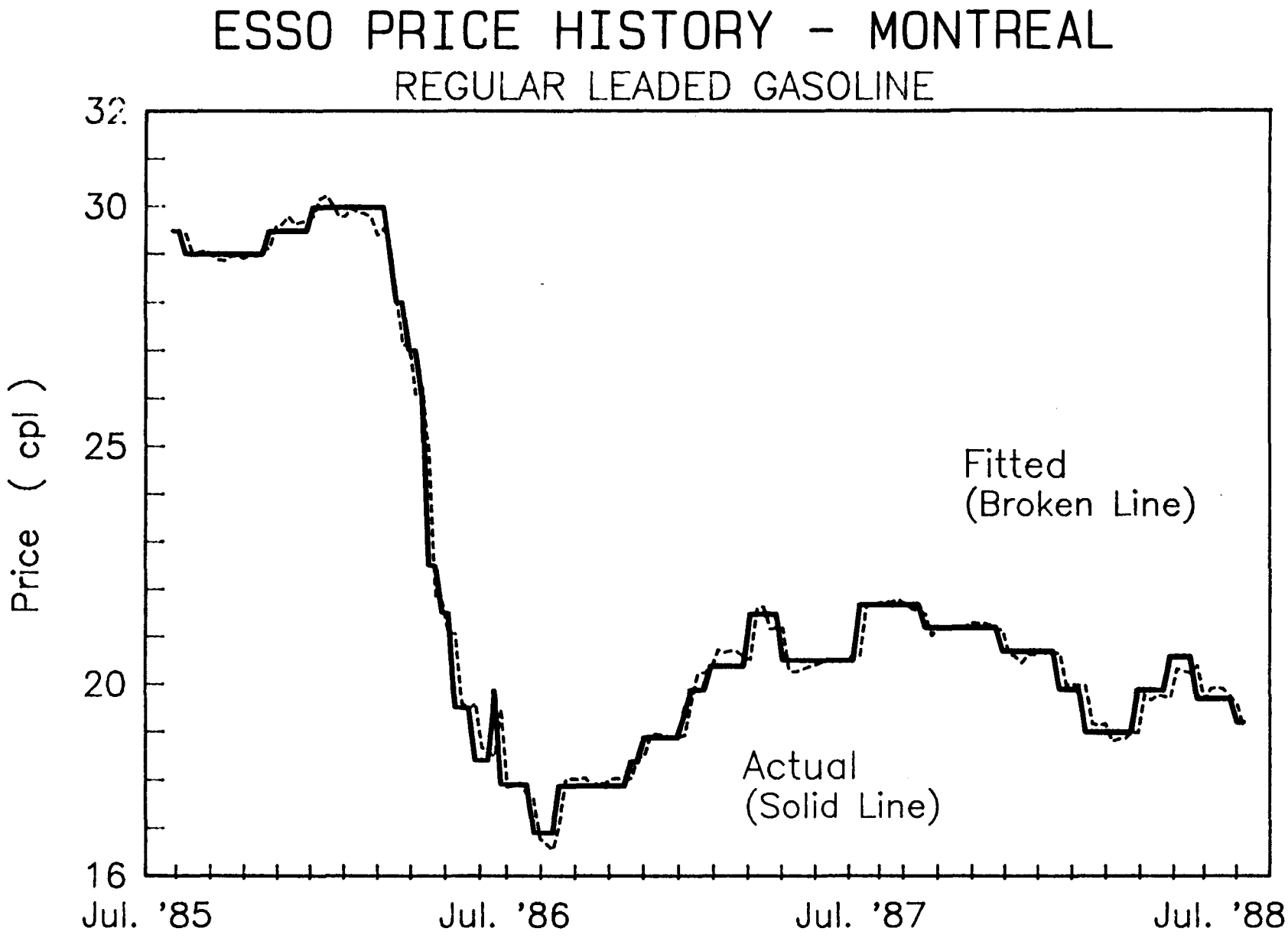

ESSO PRICE HISTORY - TORONTO
REGULAR LEADED GASOLINE
Price (cpl)
31
30
25
20
16
Jul. '85
Jul. '86
Jul. '87
Jul. '88
Fitted
(Broken Line)
Actual
(Solid Line)

Figure 7


ESSO PRICE HISTORY - MONTREAL
REGULAR LEADED GASOLINE
32
30
25
20
16
Price (cpl)
Jul. '85
Jul. '86
Jul. '87
Jul. '88
Fitted
(Broken Line)
Actual
(Solid Line)

Appendix 2

U.S. Wholesalers Close to Ontario

An independent gasoline retailer in the South Central Ontario market can obtain access to gasoline from the U.S.A. by trucking it directly from one of the Buffalo area terminals to its retail site or into storage. There are four terminals that regularly supply gasoline to the South Central Ontario market. In addition, there are two others whose owners are willing to supply Canadian independents.

(1) Ashland Petroleum Company operates a fuels products terminal at its former refinery site in Tonawanda, N.Y. This terminal is connected to the Atlantic Pipeline. Ashland presently sells to Canadian independents on a spot basis directly and through brokers. The terminal operates 24 hours a day, except Saturday noon to Sunday midnight. Contact: Charles R. Lovorn, Group Vice President, (606) 329-3333.

(2) Atlantic Refining and Marketing Corp. operates a 619 thousand barrel terminal at Tonawanda, N.Y. which is connected to the Atlantic Pipeline. Although Atlantic is not currently selling

products directly to Canadian independents, it has indicated its willingness to do so. The terminal is fully automated and can be accessed 24 hours a day. Contact: Thomas Bradley, Manager Wholesale Sales, (215) 768-1077.

(3) Mobil Oil Company operates a 1.36 million barrel terminal at the site of its former refinery in Buffalo, N.Y. This terminal is supplied via the Mobil pipeline and via marine. Although not currently selling to Canadian independent customers, Mobil indicated its receiptivity to wholesale purchases. The terminal is fully automated and can be accessed 24 hours per day. Contact: Kenneth Parent, Complex Manager, (716) 827-5125.

(4) Noco Energy Corporation operates two terminals in Tonawanda, N.Y. with a combined capacity of almost one million barrels. Both terminals are connected to the Atlantic Pipeline, and one of them can be accessed by marine. Noco is currently selling to Canadian independents who are willing to pick products at their rack. The terminals operate from 6 a.m. to 9 p.m., and is closed on weekends from Saturday noon.

(5) Sun Refining and Marketing Company operates a 200 thousand barrel terminal at Tonawanda, N.Y., supplied by the Atlantic Pipeline. Sun is currently selling sizable volumes to at least one Canadian independent. Key stop arrangements allow for after-hour loading. Contact: John McCook, Sales Manager (215) 977-3827.

(6) United Refining Company operates a 60 thousand barrel/day refinery and a terminal at Warren, Pennsylvania. United presently has sizeable volumes available for open market sales, and it currently sells product directly to at least one Canadian independent, and indirectly to others through U.S. resellers. The terminal operates 24 hours per day. Contact: Ashton Ditka, Vice President Marketing (814) 723-1500.