A MARKET STRUCTURE APPROACH TO THE IMPACT OF EXCHANGE RATE CHANGES ON EXPORTS AND THE BALANCE OF TRADE: CANADA IN THE 1960s AND 1970s.

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ABSTRACT

Traditional international trade theory relies upon the price mechanism to relate exchange rate changes to adjustments in the balance of trade. The effectiveness of the price mechanism depends upon the elasticity of demand as well as upon the market structure characterizing international trade. The "classical" approach to balance of trade adjustment, commonly referred to as the Marshall-Lerner condition, requires sufficiently high demand elasticities plus competitive market conditions to characterize international trade in order that exchange rate changes effectively correct imbalances in a country's trade account. Neither of these prerequisites necessarily typify exported commodities. On the other hand, it can be demonstrated that oligopoly is compatible with empirical evidence as well as with economic theory. When oligopoly characterizes the market structure of goods traded internationally, producers continue producing and selling in all markets, both domestic and foreign, given exchange rate changes. Since oligopoly relies primarily upon the interpersonal relationships between sellers in an industry, price becomes a parameter rather than a variable in the decision making process. Under these circumstances it becomes meaningless to hypothesize, either in theory or in practice, about the relationship between exchange rate changes, the demand for exports and balance of trade adjustments.

RESUME

La théorie traditionelle du commerce international repose sur le mécanisme des prix pour relier les variations du taux d'échange aux ajustements de la balance commerciale. L'efficacité du mécanisme des prix dépend à la fois de l'élasticité de la demande et de la structure du marché qui caractérisent le commerce international. L'approche "Classique" aux ajustements de la balance commerciale, appelée condition "Marshall-Lerner", exige un niveau d'élasticité de la demande assez élevé, ainsi que des conditions de marché concurrentiel comme préalables aux spécificités du commerce international de telle sorte que les variations de taux d'échange corrigent effectivement le déséquilibre de la balance des paiements courants d'un pays.

Ni l'une ni l'autre de ces conditions préalables ne tient compte des produits exportés. Par ailleurs, on peut démontrer que l'oligopole est la seule structure de marché efficace sur le plan empirique aussi bien que théorique. Quand le marché international des biens échangés est de caractère oligopolistique, les producteurs continuent à produire et à vendre sur tous les marchés intérieurs et extérieurs, étant donné les variations du taux d'échange. Ainsi l'oligopole repose principalement sur les relations inter-personnelles entre vendeurs dans une industrie, le prix devient un paramètre plutôt qu'une variable dans la prise de décision. Dans ces circonstances, il devient inutile d'émettre une hypothèse - autant dans la théorie que la pratique - sur la relation des fluctuations de taux d'échange, la demande pour les exportations et les ajustements de la balance commerciale.

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CHAPTER 1

INTRODUCTION

Background

The traditional, or classical approach to balance of payments adjustments focuses on consumer reaction to price changes as derived from the effects of changes in the quantity of money in circulation on exchange rates. The theoretical statement on the price mechanism, known as the Marshall-Lerner condition,[1] postulates that the balance of payments adjustment, resulting from an exchange rate change, depends on the price elasticity of demand for the commodities imported and exported by the country concerned. Its effectiveness thus relies entirely on the price mechanism.

Later theoretical analyses have concentrated on autonomous capital transfers as initiators of the payments imbalance. The Transfer Problem of the 1920's applied the theory of demand elasticity to the expansion of German exports, which were needed to pay for autonomous capital transfers (reparations). Keynes stressed that "only those who believe that the foreign demand for German exports is very elastic, so that a trifling reduction in German prices will do what is required, are justified in holding that the Transfer Problem is of no great significance".[2]

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[1] A detailed analysis of the Marshall-Lerner condition is given in chapter 2.

[2] J.M. Keynes, "The German Transfer Problem", Economic Journal, 39 (March, 1929), 6.

In the 1930's balance of payment adjustment theory was expanded to include income, output and employment considerations.[1] The Keynesian approach focuses on the influence of income, elaborating on the output and employment changes that take place in both the deficit and surplus countries. This is the theory of the foreign trade multiplier, acting through increases in the demand for factor inputs and production, as a result of an autonomous, generally external, stimulus (e.g., changed demand for exports). The initial income increase in the export sector spreads to the other sectors of the economy, including the demand for imports, which spreads the multiplier effect abroad. Exports and imports rise due to increased incomes, not due to prices, which remain unchanged.[2] Basic to this reasoning are elastic supply and employment schedules.[3]

Eventually the price mechanism and the income approach were merged.[4] Under the absorption approach a balance of payments deficit is identified with an excess of consumption over the production of goods and services. A deficit, or overabsorption, is due to the

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[1] For example, Joan Robinson, Essays in the Theory of Employment (Oxford University Press, 1937).

[2] See Charles P. Kindleberger, "The Foreign Trade Multiplier, The Propensity to Import and Balance of Payments Equilibrium", American Economic Review, 39 (September, 1949), 491-494.

[3] See Jaroslav Vanek, The Balance of Payments, Level of Economic Activity and the Value of Currency (Three lectures presented at the Graduate Institute of International Studies, Geneva, 1962), for a criticism of this analysis.

[4] See S.S. Alexander, "Effects of a Devaluation: A Simplified Synthesis of Elasticities and Absorption Approaches", American Economic Review, 49

relative cheapness of imports and export-type goods, which, in turn, is derived from an overvalued exchange rate. A domestic devaluation changes this relationship by making imports and export-type goods more expensive, leading to a fall in their domestic consumption. Absorption comes into balance through the interaction of changing incomes and prices.

The modern, or monetary, approach reintroduces the money supply into the analysis. An excessive expansion of the domestic money supply leads to a balance of payments deficit, due to the resulting excess demand for foreign currency on both the current and capital accounts. Abstracting from this analysis the excess demand for current account transactions, the monetary approach relates a balance of payments deficit to excessive domestic consumption due to excessive money balances, and a balance of payments surplus, to underconsumption due to insufficient money balances. An exchange rate change will correct the imbalance: a devaluation will adjust an overvalued domestic currency, leading to a reduction in real purchasing power and, therefore, domestic consumption;[1] money balances will no

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(4 cont'd) (March, 1959), 22-42. Alexander was also concerned with other ideas, such as the terms of trade and cash balance effects, that were directly involved in the interrelationship between income and the trade balance. See Alexander, "Effects of a Devaluation on a Trade Balance", IMF Staff Papers, 2 (April, 1952), 263-278.

[1] Harry Johnson discusses the absorption approach in terms of expenditure-switching and expenditure-reducing policies and in this manner expands the general applicability of this approach to balance of payment problems; see Johnson, International Trade and Economic Growth: Studies in Pure Theory (Cambridge: Harvard University Press, 1961), 153-168.

longer be considered excessive and the demand for foreign currency will fall. Similarly, a revaluation will lead to an increase in domestic purchasing power in real terms, money balances will grow, and the demand for foreign currency will increase.

None of the above analyses take into account market imperfections. Each relates the cause of the original disequilibrium to consumer demand and/or output changes derived from changes in consumer demand. Consumer demand, in turn, is influenced by price changes, income changes, or changes in prices and incomes together. Also, the market structure underlying the theories that dominate the literature is perfect competition. The literature does not relate the adjustment mechanism to the possibility that monopolistic or oligopolistic practices characterize the reactions and behavior of many firms and industries involved in international trade. In reality, however, monopolistic or oligopolistic practices predominate. This is not only true of manufactured industrial products, characterized by multinational firms, but also of many, if not most, of the raw materials and semi-fabricated products that constitute the major portion of the exports of many countries, of which Canada is a typical example.

Recently, the effect of industrial organization on international commodity trade has been examined more clearly. According to Caves, the inter-relationship of industrial organization and international trade is an area that could provide very interesting

results regarding the causes and effects of trade flows. "Lulled by the mathematical convenience of purely competitive conditions, theoretical research has paid little attention to the causes or consequences of imperfect competition (in international trade)..."[1] In recent years, economists have begun to explore this inter-relationship, in effect disregarding the fundamental foundations that form the basis to the traditional theory of international trade. The present thesis explores the relationship between industrial organization, or market structure, and commodity exports, within a framework of changing exchange rates.

Thesis

The purpose of this thesis is to determine whether or not exchange rate changes affect the volume of exports. In the analysis, it is crucial to investigate the relationship between theoretical market structures and the marketing of exports. In analyzing this relationship, the thesis hypothesizes that it is unlikely that exports will be sold within a market structure other than monopoly or oligopoly. Other market structures (especially perfect competition) fail to take into account the dichotomy that takes place in the sale of commodities in the domestic and foreign markets when exchange rates change. Therefore, such approaches are unrealistic and should

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[1] Richard E. Caves, International Trade, International Investment, and Imperfect Markets, Special Papers in International Economics, No. 10 (Princeton University, 1974), 27.

not be used in analyzing the probable effects of such exchange rate changes on the demand for exports. It is more realistic to analyze such effects via a monopolistic or oligopolistic market structure. As is shown in chapter 3, both monopoly and oligopoly allow the analysis to separate exports from domestic trade, and both deal with the firm within the context of a market divided between domestic and international trade.

Chapter 2 examines the literature devoted to the price elasticity of demand for exports. As the thesis is concerned with the export side of a country's balance of trade a critical analysis of the export portion of the Marshall-Lerner condition is presented together with a summary of the empirical studies that both support and refute the condition. The general conclusion to be drawn from this review is that, even if export volume is influenced by price changes, there is no concensus among investigators that the pertinent elasticities are large enough to confirm the empirical applicability of the Marshall-Lerner condition.

Chapter 3 discusses the various market structures employed in economic theory. Each is analyzed in terms of the effects of exchange rate changes on market equilibrium prices and quantities. The role of firms, both before and after the exchange rate changes, is discussed in terms of the theoretical effects of such changes on the demand curves they face and the prices they must realize in order to remain viable in export markets. The conclusion reached is that only firms operating within monopolistic or oligopolistic markets can

theoretically remain viable in both the home and export markets in the long-run.

Chapter 4 builds on the concept of market concentration by a few firms within an industry and relates this concept to Canadian exported commodities. Using a market concentration model developed by Bain[1] and data on firm concentration compiled by the Canadian, American, and British governments, it was determined that more than 75% of the value of Canadian exports are produced and sold in highly concentrated domestic industries, while at least 70% of the value of Canadian exports are sold in foreign markets characterized by highly concentrated industries. The results of chapter 4 thus confirm the analytical hypothesis of chapter 3.

Chapter 5 analyzes the export histories of four important Canadian exported commodities, whiskey, rapeseed, asbestos and newsprint. The industrial market structure of these industries, both in Canada and in the export markets pertinent to Canada, are also discussed. In each case, the detailed analysis confirms the concentration results of chapter 3 and confirms the effects of exchange rate changes on export volume as derived in the analyses of chapters 3 and 4.

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[1] Joe S. Bain, International Differences in Industrial Structures (Yale University Press, 1966).

CHAPTER 2

COMMODITY EXPORTS AND THE PRICE ELASTICITY OF DEMAND

Introduction

The price effect of an exchange rate change on the demand for home commodity exports is derived from the foreign consumers' responses to the theoretical change in the foreign market price of these exports. When prices in the export markets change the effect on the overall value of exports depends on the sum of the weighted averages of the pertinent price elasticities of demand of consumers for the exports of the country concerned, as well as on the relevant supply elasticities. When the prices in the export markets do not change[1] changes in export volume cannot be expected to result from foreign consumer response. The effects on the balance of trade will then be supply-oriented and the theory of demand price elasticity regarding adjustments to the balance of trade will be empty of meaning.

In the literature it is believed, ceteris paribus, that if the sum of the weighted averages of the price elasticity of home demand for imports, plus the sum of the weighted averages of the price elasticity of foreign demand for home exports, is greater than 1, the desired effects will come about;[2] on the other hand, if the sum of these elasticities is less than 1 the home country's balance of payments problems will worsen as the result of a currency change.

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[1] The possibility of which is analyzed in chapter 3, below.

[2] That is, devaluation will lead to an improvement, and revaluation, to a deterioration, in the balance of payments.

This hypothesis, upon which most theorizing was based up to the 1940s and which still preoccupies much of the literature and governmental policy regarding exchange rate changes and balance of payments adjustments, is known as the Marshall-Lerner condition.

The Marshall-Lerner Condition[1]

The original stability conditions in the two country trade model were expressed in terms of the elasticity of each country's offer curve: the sum of the weighted averages of the elasticities of the excess demands for the commodities traded between the two countries must exceed unity for an exchange rate change to be effective in adjusting a balance of trade imbalance. In deriving the stability conditions using offer curves the discussion of demand elasticities implicitly involves the size of the relevant supply elasticities, as shown by Ronald Jones.[2] As demonstrated by Jones, letting the price of exports in the exporting country's currency unit serve as numeraire, the supply elasticities become infinite by definition and the stability condition assumes the traditional formulation (that is, the sum of the demand elasticities must exceed unity). This is the normal relationship used and the special assumptions made

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[1] First mentioned by Alfred Marshall in The Pure Theory of Foreign Trade, The Pure Theory of Domestic Values (London, London School of Economics and Political Science, 1879), and later developed by Abba Lerner in The Economics of Control (New York, MacMillan, 1944).

[2] Ronald W. Jones, "Stability Conditions in International Trade: A General Equilibrium Analysis", International Economic Review, 2 (May, 1961), 199-209. Jones notes that "the elasticity of a country's offer curve is the sum of its elasticity of demand for imports and elasticity of supply of exports". Ibid, 201.

in the literature when analyzing the effect of exchange rate changes on a country's balance of trade, and it is the relationship traditionally associated with the Marshall-Lerner condition.

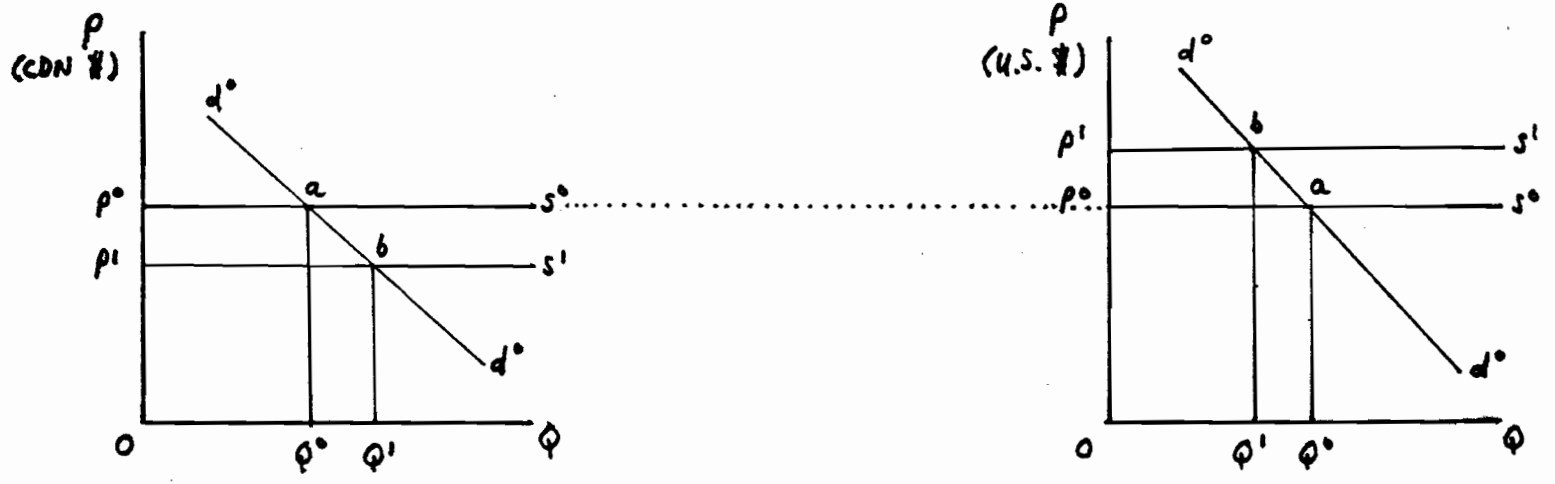
The Marshall-Lerner condition is based on two assumptions: initial balance of trade equilibrium and high supply elasticities. When balance of trade equilibrium exists there is no necessity for a country to alter its exchange rate. Therefore, the balance of trade must be initially in disequilibrium. The greater the initial disequilibrium the greater must be the sum of the demand elasticities of the Marshall-Lerner condition if an exchange rate change is to eliminate the balance of trade disequilibrium.

The assumption of high supply elasticities assures that the full impact of the exchange rate change is derived via the demand elasticities. An exchange rate change will cause an apparent shift in the market supply curve such that the impact on trade is determined by the size of the demand elasticities (see figure 2-1, below). Since supply elasticities for individual sellers are infinite under perfect competition, it is the only market structure that guarantees the above conditions in the long-run.

Therefore the Marshall-Lerner condition relies upon two characteristics of the markets for internationally traded goods - the size of the demand elasticities and perfect competition - that, empirically, are questionable, except perhaps for a small number of

Figure 2-1

Canadian Dollar Revaluation



commodities. It can be demonstrated that most internationally traded goods enter markets of such imperfections that the theoretical effects of exchange rate changes are neutralized.[1] This leads to the conclusion that exchange rate changes will not necessarily be translated into price effects, leaving the Marshall-Lerner condition concerning the effects of the market demand elasticities on the volume of exports, empty. It is further believed that even the Marshall-Lerner statement concerning these elasticities has not been empirically verified.

Export Mix

The mix of foreign consumers and exported commodities varies from exporting country to exporting country. The price elasticities applicable to one country and to one set of commodities will most likely be quite different to those of another exporting country even though it may appear that the two countries and bundles of commodities possess similar characteristics (and are, therefore, the same, statistically speaking). In the literature, discussion usually centres on the price elasticity of demand for the exports of an industrial country or of a developing country, as though industrial and developing were two classifications into which all trading countries fit. In the same vein, price elasticities are estimated for groups of commodities as opposed to individual commodities, as though the groups contained homogeneous products,

[1] See chapter 4, below.

sold in homogeneous markets. Each of these general classifications leads to the wide-ranging results that, to date, characterize the studies in the literature.

Price Elasticities of Demand: By Country

Most exporting countries sell to a wide variety of economies, from those that are the least industrialized to those that are the most highly industrialized. Often, trading patterns stem from geographic presence, as in the case of Canadian-American trade, or due to historical presence, as in the cases of the trade between the U.K. and France and their former overseas colonies. Perhaps the most important reason for international trade is the need, or desire, of the consumers of one country for the products of another.

A combination of the above reasons explains the diversity of countries, as well as the predominance of specific countries,[1] that have traditionally purchased more than 90% of all Canadian commodity exports (especially from 1961 to 1974).[2]

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[1] Four have accounted for more than 80%.

[2] See chapter 4, table 4-1.

Cumulative Table of Canadian Exports by Country, from 1961-1974:

USA	64.5%	China	82.1	Belgium	86.9
U.K.	73.5	Netherlands	83.4	U.S.S.R.	88.0
Japan	78.8	Italy	84.6		
W. Germany	80.8	Australia	85.8		

As the price elasticity of demand for Canadian exports varies from commodity to commodity and from country to country, it is not sufficient to treat the price elasticity of Canadian exports to all countries as being equal to the estimated elasticity for Canadian exports to the U.S. alone.[1] It is not even logical to base prediction and policy on data compiled by two researchers for the same commodity. As stated by Murray Kemp, "...No two economists specify the demand functions in the same way, no two use the same data, and no two employ the same estimating procedure ..."[2]

In an article based on the 1949 European devaluations,[3] Harberger[4] gives estimates of the elasticities of world demand for the total exports of eleven countries or geographic areas, Canada among them. His estimates range from -3.5 for Germany/Austria, to -0.8 for the U.K. The estimate for Canada was -1.1. These estimates were calculated under the assumption that imports from all sources were equally substitutable, a highly questionable assumption considering the nature of this aggregative study.

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[1]This is an assumption made by most researchers and most recently by Robert Dunn, Jr. in his unpublished doctoral thesis, "Flexible Exchange Rates and the Prices of Traded Goods: A Study...." (Stanford University, 1966).

[2]Murray C. Kemp, The Demand for Canadian Imports, 1926-1955 (University of Toronto Press, Toronto, 1962), 71.

[3]See tables 2-1 and 2-2 for summarized findings of all studies discussed in this chapter.

[4]Arnold C. Harberger, "Some Evidence on the International Price Mechanism," Journal of Political Economy, 65 (Dec., 1957), 519.

De Vries,[1] in an article estimating the price elasticity of demand in the U.S. in 1959, for total imports from thirteen different Western European countries, includes figures ranging from -1.02 (Greece) to -6.39 (Netherlands) for a tariff decrease equal to 50%, and figures of from -0.62 (Greece) to -5.70 (Netherlands) for a tariff increase equal to 50%. The weighted average was -2.74 for a tariff increase, and -2.23, for a decrease. This compares with -2.1 estimated by Harberger, for U.S. imports from all countries ten years earlier.[2] While the weighted averages appear to be similar, the individual country values showed a wide range. Therefore, none, not even the weighted averages, can be taken as representative of the others.

The Junz and Rhomberg study, on the effect of prices on the export performance of industrial countries covering the period from 1953 to 1963,[3] states that the long-run price elasticity of demand for manufactured products by industrial countries was between -3 and -5. In another article, published within a year, Rhomberg and Boissoneault[4] estimated that the price elasticity of demand by Western Europe for all imports from the U.S. was -1.0 for the period 1948 - 1962; that the demand elasticity of Americans for imports from Western Europe

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[1]Barend A. de Vries, "Price Elasticities of Demand for Individual Commodities Imported Into The U.S.," IMF Staff Papers, 1 (1950-1951), 411.

[2]Harberger, op. cit.

[3]Helen B. Junz and Rudolf R. Rhomberg, "Prices and Export Performance of Industrial Countries, 1953-1963," IMF Staff Papers, 12 (July, 1965), 259.

[4]Rudolf R. Rhomberg and Lorette Boissoneault, "Effects of Income and Price Changes in the U.S. Balance of Payments," IMF Staff Papers, 11 (March, 1964), 66.

was -1.3; and that the demand elasticities of Western Europe and the U.S. for imports from the rest of the world were -0.6 and -0.4, respectively. In the latter article a qualification was added to make allowance for the inclusion of agricultural imports by Western Europe (discussed below). The discrepancy between the results of the two articles is neither commented on nor supported in the second article.

In a highly enlightening article, Houthakker and Magee discuss the income and price elasticities of major industrial economies using data from 1951 to 1966.[1] The price elasticity results varied so much that summarizing them would prove misleading. In general, the price elasticities were very low, and for imports were less elastic than they were for exports (however, for Canada the elasticities were -1.46 for imports and -0.59 for exports).[2] Analyzing the same data for the U.S. alone the figures proved much more elastic, depending on the data used to calculate the price variables.[3] However, the

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[1] H.S. Houthakker and Stephen P. Magee, "Income and Price Elasticities in World Trade," Review of Economics and Statistics, 51 (May, 1969), 111-123.

[2] Ibid., 113.

[3] Ibid. The 4 price variables used were:

P_1 = PMi/WPIi , where X refers to exports; M, to imports;
P_2 = PXj/PXWj i, to the importer; j, to the exporter;
P_3 = PXj/PMi WPI, to the wholesale price index; and W,
P_4 = PXj/WPIi to all other countries.

results did not appear to be uniform when countries were compared with one another or when price variables were compared.

The results of each article, or study, appear to confirm the general opinion, previously expressed, that the price elasticity of demand for the products of a specific country varies significantly from one importing country to the next, and that it is impossible to find a consensus of opinion among researchers as to the most appropriate estimate of the price elasticity of any one country. Therefore, in the case of Canada, it would be misleading to estimate the price elasticity of demand for total Canadian exports to all its customers using any one of Canada's trading partners as a proxy; it would also be misleading to estimate this elasticity using data compiled for a period other than the one for which the export data is being examined. From a review of the results of the studies mentioned above and others, acting otherwise leaves the results subject to unknown errors.

None of the country studies has estimated the price elasticities of demand for more than a few countries, not to mention fewer still of those consuming countries important to Canada. All use aggregate data. Yet, to test the validity of the Marshall-Lerner condition it is of prime importance to make individual estimates for each consuming country and then to aggregate and weight the individual estimates to determine the overall price elasticity of demand for exports. In accepting the Marshall-Lerner condition and

in testing its empirical validity, none of the researchers has proven that the Marshall-Lerner condition is applicable in testing whether or not exchange rate changes affect commodity exports by using diaggregated price elasticity estimates for individual countries.

Price Elasticities of Demand: By Commodity

While some studies classify countries by the nature of their principal exports, that is, raw materials or manufactured products, some attempt to measure the price elasticity of the demand for an individual product or group of similar products. Unfortunately even these latter studies do not disaggregate enough. The five general groups of commodities devised according to the Standard International Trade Classification (SITC) and to which most international organizations and countries adhere (including Canada),[1] are further sub-divided into literally hundreds of different commodities or commodity groups. For Canada there are almost three hundred distinct commodities whose export values exceeded $10 million in at least one year between 1961 and 1974. It is entirely conceivable that a different price elasticity of demand for each commodity would be estimated on a year to year and country by country basis.

Within each class of products based on the general state of production (such as raw materials and end products), there are a

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[1] The five groups are: live animals; food, feed, beverages and tobacco; crude materials, inedible; fabricated materials, inedible; and end products, inedible.

variety of uses and users. It would be an error to aggregate all commodities of one class together when examining the price elasticities of demand for the commodities of the class, or in applying the results of one study to the demand for the exports of a totally different country. Canadian raw materials, for example, include commodities from four of the five SITC groups, and these commodities have numerous different types of users. For example, included in raw materials are such diverse food items as wheat, apples, fish and fertilizers; also included are consumer commodities, such as tobacco; luxury commodities, such as fur skins and lobster; building materials, both residential and commercial, such as lumber and asbestos; and industrial products, such as metal ores and energy resources. Within the partially manufactured and end products classes are an equal, if not greater, variety of commodities for which both the uses and users are distinctly different. To group all these products together obscures these differences, causing any analyses, and their derived results, to be subject to possible gross misstatement in both content and interpretation. In a study of the price elasticities of Canadian imports, Kemp notes that:

> The most striking feature of the existing published estimates is that in not a single instance has a statistically significant price coefficient been obtained. The failure may be partly illusory, the product of the employment of an inappropriate price variable.... To the extent that the failure is not illusory, it must be attributed, in the light of our results, to the fact that, with a single exception, all investigators have been content to

deal with aggregate commodity imports.[1]

Kemp, in his criticism, corroborates the statement made above, that for demand price elasticities to be useful, they must be estimated on a disaggregated basis. Otherwise, the results can only be considered dubious, an approximation, and not useful in interpretation and prediction.

In a study on the price elasticity of demand for specific Canadian exports to the U.K. and the U.S., Vernon Malach[2] developed estimates that were very small, as seen in table 2-1. Malach's decision to estimate the elasticities for individual commodities was based on his belief that the price elasticities for whole groups of commodities tended to hide the response to price changes of the individual commodities. Thus, the only manner in which to truly understand the effect of price changes on a country's total exports is to examine the effects on its individual exports. While Malach, in effect, followed Kemp's advice, his estimates were too few and too low to prove the applicability of the Marshall-Lerner condition.

Horner's estimates of the price elasticity of demand for Australian wheat, using 1938 data, were much higher than were Malach's

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[1] Kemp, op. cit., 71. The exception noted by Kemp used commodity categories whose components were very heterogeneous as regards end use, and for which price series were not even available.

[2] Vernon W. Malach, "Elasticity of Demand for Canadian Exports," Review of Economics and Statistics, 39 (Feb., 1957), 28. Wheat to U.K., 1920-1938; newsprint, woodpulp and iron ore to U.S., 1919-1939.

for Canadian wheat,[1] confirming Kemp's suspicions.

Morgan and Corbett's analysis[2] failed to reveal to its authors any method that would allow them to base an opinion on the alternative instruments available for correcting a balance of trade disequilibrium. De Vries' extensive work, previously cited,[3] on the effect of an exchange rate change equal to a 50% increase or decrease in the American tariff on four hundred and fifty imported commodities, resulted in price elasticities for individual commodities ranging from 0 to -21.1. He concluded that "commodities whose imports supply a relatively large share of the U.S. market tend to have a relatively low elasticity of import demand; while commodities whose imports supply a relatively small share of the market have relatively high elasticities".[4] This is substantially the same conclusion drawn by Horner.[5] Orcutt generalized this by stating that the elasticity

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[1] F.B. Horner, "Elasticity of Demand for the Exports of a Single Country," Review of Economics and Statistics, 34 (November, 1952), 335.

[2] D.J. Morgan and W.J. Corbett, "The Influence of Price in International Trade: A Study in Method," Journal of the Royal Statistical Society, Series A, 114, part 3 (1951), 314-315. Wheat from Australia and New Zealand to the U.K., 1924-1938; iron ore from Spain and Algeria to the U.K., 1920-1936; copper ore from Canada and Spain to the U.K., 1922-1936; cement from Belgium and Denmark to the U.S., 1922-1939; newsprint from the U.K. and Canada to Australia, 1922/3-1937/8; steel plates from the U.K. and Germany to Sweden, 1920-1938; and sheet and plate glass from the U.K., Belgium and the rest of the world to India, 1919/20-1938-9.

[3] de Vries, op.cit., 401.

[4] Ibid., 413.

[5] Horner, op. cit., 326-327.

of demand in an import market, for a commodity from a particular country, is generally greater than the elasticity of demand for the commodity as a whole.[1] Thus market size appears to affect demand elasticity more than do price changes.

Khan concluded that the estimated price elasticities were relatively high for developing countries,[2] indicating that relative prices have a significant effect on their import demands, and that, in a number of these countries their half of the Marshall-Lerner condition for a successful devaluation would easily be satisfied. No mention is made of the other, perhaps the most crucial, half of the condition, regarding the demands for the exports of developing countries.

Artus and Rhomberg examined both the import and export price elasticities of demand for fifteen industrial countries,[3] including Canada. Their figures reveal rather low elasticities for groups of exports other than manufactured products, and lower elasticities for all groups of imports. It is interesting to note that their estimates of the Canadian elasticities for manufactured products were

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[1] Guy Orcutt, "Measurement of Price Elasticities in International Trade," Review of Economics and Statistics, 32 (May, 1950), 119.

[2] Mohsin S. Kahn, "Import and Export Demand in Developing Countries," IMF Staff Papers, 21 (1974), 691.

[3] Jacques R. Artus and Rudolf R. Rhomberg, "A Multilateral Exchange Rate Model," IMF Staff Papers, 20 (November, 1973), 603.

lower for exports than for imports,[1] a result they obtained for only one other country, West Germany. Their estimates, however, contrast with the estimates in the Khan study, making them all the more controversial.

Ridler and Yandle estimated the price elasticity of demand for a primary commodity to be substantially less than -1.0, even though they used varying supply elasticities.[2] In studies by Fleming and Tsiang,[3] Kreinen,[4] Harberger,[5] and Junz and Rhomberg,[6] the estimate for the price effect, resulting from the elasticity of substitution for manufactured exports, all lay within the limits set in the study by Artus and Rhomberg. In Spitaller's analysis of the effect of the 1961 German and Dutch revaluations on their exports of

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[1]This relationship had been cited previously, in a study by Houthakker and Magee, op. cit., 113.

[2]Duncan Ridler and Christopher A. Yandle, "A Simplified Method for Analyzing the Effects of Exchange Rate Changes on Exports of a Primary Commodity," IMF Staff Papers, 19 (November, 1972), 564.

[3]J.N. Fleming and S.C. Tsiang, "Changes in Competitive Strength and Export Shares of Major Industrial Countries," IMF Staff Papers, 5 (1956-57), 218-248.

[4]M.E. Kreinen, "Price Elasticities in International Trade," Review of Economics and Statistics, 49 (1967), 510.

[5]Harberger, op. cit.

[6]Junz and Rhomberg, op. cit., 240.

manufactured products,[1] the elasticities varied considerably, depending on whether or not the competing source for the manufactured products was also a member of the EEC. Generally, the elasticities were larger if the competing source was an EEC member and if the time lag was three years rather than two. In Houthakker and Magee's study,[2] the long-run price elasticities for U.S. imports and exports appeared to be reasonably within the limits of the other studies.

My main criticisms of all these studies are that they all use highly aggregated data, there is a wide discrepancy between the estimates for the same products from various countries, and no two researchers agree on any estimate for any of the countries.

Kindleberger and Lindert list five reasons why the elasticities estimated in regression studies are probably lower than the true elasticities.[3] Although it would appear that their reasons are

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[1] Erich Spitaller, "The 1961 Revaluation and Exports of Manufactures," IMF Staff Papers, 17 (March, 1970), 114-117.

[2] Houthakker and Magee, op. cit., 121-122.

[3] Charles P. Kindleberger and Peter H. Lindert, International Economics (Richard D. Irwin, Inc., Illinois, 1978, 6th edition), 288-291. Only two studies were used: Houthakker and Magee, op. cit., and F. Gerald Adams and Helen B. Junz, "The Effect of the Business Cycle on Trade Flows of Industrial Countries," Journal of Finance (May, 1971). The five reasons for believing that the estimated elasticities were lower than the true ones are:

1. By assuming that the responses of quantity to price were demand responses, the estimates failed to identify the shifting demand and supply curves from data on prices, quantities, and other variables.
2. The estimates are based on an era (1951-1966) in which price changes were smaller than they would be under devaluations, and demand may respond with lower elasticity to small price changes than to large.

plausible, it is equally true that arguments could be made suggesting that the estimated elasticities are actually larger than the true ones. Either way, the criticisms of the studies reviewed above still hold, since, for the most part, they concern the data used and the application of the resulting estimates to predicting the probable results of exchange rate changes on the balance of trade.

Conclusion

For the theory of price elasticity of demand and the exports side of the Marshall-Lerner condition to be operational there must be means of estimating consistent elasticities on a commodity-by-commodity and country-by-country basis for the commodities traded in international markets. Without such estimates the theory remains merely a theory, without any use in prediction and policy making.

Although not stated explicitly by the "classical" theorists, it was probably the elasticity of world demand for a particular commodity that they considered in discussions of import and export elasticities. If the world demand curve for, say, commodity X is elastic at the current world price for X, then any country exporting X could increase (decrease) the value of its X exports by devaluing

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(3 continued)

3. The estimates of one-year elasticities are probably lower than the longer-run elasticities.
4. The use of highly aggregated data may give undue weight to goods with relatively low elasticities.
5. The data may reflect errors of measurement of quantity, price, and other variables, errors that are likely to bias the elasticity estimates toward zero.

(revaluing) its currency.[1] The same would apply to all commodity exports. Thus, it is not the elasticity of particular countries for the exports of the country contemplating a currency devaluation or revaluation that the "classical" theorists must have had in mind, but rather the weighted average of the elasticities of world demand for the bundle of commodity exports exported by the country contemplating an exchange rate change. None of the studies reviewed in this chapter included regressions of world demand for individual commodities of individual countries. Yet, "the willingness of policymakers to rely on exchange rate and price adjustments to rectify payments imbalance, rather than intervene directly with exchange controls that ration the right to trade, depends on their faith in the demand elasticities, which in turn rests on econometric estimates".[2]

A review of the literature shows that researchers have not yet begun to estimate individual price elasticities on as wide a scale as is required to give some empirical validity to the "classical" theory. Those estimates that have been made either use highly aggregate data, so that their use in prediction is open to question, or the results vary from one study to the next, leaving the reader to question whether price really does influence the quantity demanded in export markets.

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[1] The validity of this statement centers around whether or not exports of the commodity concerned are denominated in the currency of the exporting country or in the currency of the importing country, a matter discussed in detail in chapter 3.

[2] Kindleberger and Lindert, op. cit., 287.

Therefore, the degree to which prices influence the demand for exports is in question. As this controversy has not been resolved by past empirical studies, the analysis that follows analyzes the various theoretical market structures as they apply to international commodity trade, in order to determine whether or not those market structures that characterize international trade tend to prevent changes in export prices. If export prices do not change, as they theoretically should when exchange rates change, it must be concluded that price is not a valid variable in the determination of export volume. This would leave the Marshall-Lerner condition, and "classical" theory regarding the balance of trade adjustment mechanism via the price effect, theoretical propositions invalidated by the actual market conditions in which commodities are traded internationally.

Appendix to Chapter 2

Income Elasticity of Demand

Modern balance of payments theory stresses income changes over price changes as the relevant variables in the adjustment process. Writers like Harry Johnson and S.S. Alexander have tried to synthesize the two approaches. Several writers, when investigating the effects of price changes on exports, have found that income, included as an additional variable in their regressions, not only appeared to explain more of the change in export volume than did the price coefficient, but also performed more consistently.

Houthakker and Magee emphatically argue that, given two countries with the same price elasticities of demand, the one with the greater income elasticity of demand for the products of the other will experience a greater rise in its bilateral imports and will eventually experience balance of payments problems.[1] From their analysis, they predict that, because of Japan's diverging income elasticities of demand for imports and exports (+1.23 versus +3.55), Japanese incomes would have to grow three times as fast as the incomes of its trading partners before the Japanese would experience balance of payments problems due to income trends.[2] Thus, it is possible for such an economy to experience greater inflation than its trading

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[1] Houthakker and Magee, op. cit., 111.

[2] Ibid., 113.

partners without the necessity of being concerned with balance of payments deficits. For such an economy, price changes of domestic, as well as foreign, origin become insignificant influences in the growth of its imports and exports.

Houthakker and Magee cite the U.K. as the antithesis of Japan: the income elasticity of British demand for imports is twice the foreign income elasticity for British exports. Their results also give interesting appraisals of the future growth of both American and Canadian trade. Their evidence reveals that the low world income elasticity of demand for American exports is not due to the preponderance of agricultural products in the American export mix. The income elasticity was estimated to be +1.02 for agricultural exports, +1.12 for non-agricultural exports, and only +1.17 for finished products. The implication of these results was that the U.S. is gradually becoming a net importer of manufactured commodities.[1] The results also indicated that, based on income alone, Canada's trade balance with the U.S. will tend to move in favour of Canada due to a higher American income elasticity of demand for imports of commodities exported by Canada than the corresponding Canadian income elasticity for imports from the U.S. This conclusion can be invalidated by Canadian export prices rising at a correspondingly higher rate than those of American exports to Canada.

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[1] Ibid., 121.

Unfortunately, there have been too few studies that have included and compared both the price elasticities of demand and income elasticities approaches to give more than a cursory review.

Table 2-1

Price Elasticities of Demand
for Specific Exports

Study	Malach		Horner		Morgan/Corbett	de Vries 50% Tariff reduction	de Vries increase	Artus/ Rhomberg
Commodity	e_s=0.1	e_s=0.8	e_s=0.0	e_s=0.2				
Wheat	-0.46	-0.15	-2.87	-5.20	-12.15	-14.86	-14.29	
Barley, Malt[a]						-10.56	- 3.44	
Lead						- 1.13	- 1.60	
Iron ore	-0.02	-0.02			- 2.46			
Copper ore					+ 2.09	- 2.17	- 2.38	
Aluminum						- 5.19	- 5.88	
Lumber						- 3.60[b]	- 3.89[b]	
						- 3.33[c]	- 2.22[c]	
Woodpulp	-1.11	-0.82						
Newsprint	-1.45	-0.73			- 9.00			
Cement					- 3.26	- 1.71	- 4.41	
Glass					- 1.83[d]			
					- 2.23[e]			
Fuels								-0.1 to -0.5
Steel plates[f]					- 4.45	- 3.14	- 4.53	
Electrical Apparatus						- 2.83	- 3.02	
Machinery vehicles[g]						- 7.96	- 8.70	
Cheddar cheese						- 4.84	-21.13	
Tobacco						- 1.23	- 0.76	
Whiskey						- 0.96	- 1.00	
Cattle, beef						- 2.79	- 5.15	
Port						- 5.47	- 3.41	
Fish						- 1.83	- 2.47	
Shellfish						- 2.79	- 3.26	

Notes: a) For all food grains
b) Softwood
c) Hardwood
d) Exports from the U.K. and Belgium to India
e) Exports from the U.K. and the rest of the world to India
f) For all iron and steel products
g) Except automobiles and electrical products

Table 2-2

Price Elasticities of Demand for Groups of Exports

GROUP / STUDY	Food, Beverages, Tobacco	Crude Materials	End Products	Crude Foods	Semi-Manufactured
Houthakker/ Magee		-0.31(o) -0.18(n)	-1.22(o) -4.05(n)	-0.21(n)	-1.40, -1.83(n) to -1.91(o)
Adler/Schleisinger/ van Westerborg[1]			-5.0 (a) -2.5 (b)		
de Vries		-1.60(c) -0.80(c)	-2.43(c) -3.12(d)		
Artus/ Rhomberg re: Canada	-0.1 to -1.0 (e) -1.0	-1.1 to -0.5 (f) -0.1 to -0.5 (f)	-1.0 to -3.0 (f) -2.0 to -1.5 (g)		
Ridler/Yardle		-0.2 to -0.8			
Fleming/Tsiang			-1.7		
Kreinen			-2.6		
Harberger			-2.4 (h) -1.6 (i) -1.7 (j)		
Junz/Rhomberg			-2.2 (k)		
Spitaller			-1.77 to -2.04(l) -2.37 to -3.06(m)		

Notes: a) Imports to U.S. from U.K.
b) Imports to U.S. from Marshall Plan countries.
c) Exports from U.K. to U.S., 50% tariff increase.
d) Exports from U.K. to U.S., 50% tariff decrease.
e) -1.0 for most exports from industrial countries.
f) Lower limit for imports; higher limit for exports.
g) Lower figure for exports.
h) German, for American exports.
i) German, for U.K. exports.
j) German, for French exports.
k) German, for rest of world exports.
l) Netherlands, for total world.
m) Germany, for total world.
n) Imports.
o) Exports.

[1] Cited in Harberger, op.cit., 520.

CHAPTER 3

THEORETICAL MARKET STRUCTURES AND INTERNATIONAL TRADE

Introduction

In the present chapter the relationships between the pricing of internationally traded commodities and economic theories of market structures are analyzed. The purpose is to determine the conditions under which a change in exchange rates can affect export volume, given the market structures in which commodities are traded internationally. As explained in chapter 2, for exchange rates to have a direct effect on exported volume there must be a price change. In the present chapter I question the theoretical basis underlying the relationship between exchange rate changes and price changes. Together with the conclusions arrived at in chapter 4, I maintain that most Canadian exports are either marketed by firms that have discretionary pricing power and hence may not pass on the price effects of an exchange rate change, or by firms that either cannot, or will not pass the effects on due to the market structure characterizing their industry. As a result, foreign buyers are rarely confronted with price changes that theoretically should result from exchange rate changes. By this reasoning, the price elasticity approach to balance of trade disequilibrium becomes a meaningless analytical tool.

The present analysis suggests that with certain market structures exchange rate changes will lead to domestic firms

theoretically expanding their export market shares at the expense of producers in foreign countries (with a home currency devaluation), or their own export market shares will shrink to insignificance (with a home currency revaluation). On the other hand, firms exporting out of and into an oligopolistic market structure theoretically absorb the price effects of exchange rate changes. Such firms could penetrate or withdraw from export markets as a result of exchange rate changes, which would directly affect export volume, but need not act in this manner, as explained later on in the present chapter. Therefore, it is only within the framework of oligopoly wherein lies the relevancy in analyzing the effects of exchange rate changes on the volume (and value) of exports. Only such an analysis can determine whether or not, and to what extent, changing the exchange rate is a useful tool in correcting an imbalance in a nation's balance of trade.

In the following discussion I employ partial equilibrium analysis, the traditional theoretical framework in which problems concerning international trade in general, and balance of trade questions in particular, are analyzed. In this manner, the analysis centers around a determination of the effects of exchange rate changes on firms within each type of theoretical market structure. This, in turn, will determine the effect of exchange rate changes on the balance of trade. As the restrictions imposed by partial equilibrium analysis are somewhat unrealistic in terms of empirical events, the analysis of perfect competition will include a discussion

of the overall implications of exchange rate changes within a general equilibrium framework.

Simplifying Assumptions

In the analysis that follows, the assumptions listed below have been made regarding the behavior of sellers and buyers in order to eliminate arguments that would unnecessarily complicate the central problem:

1. Sellers' costs remain constant (they contain no import content).
2. Sellers and buyers are in long-run equilibrium initially.
3. Seller and buyer expectation regarding future exchange rate changes are ruled out. They regard the exchange rate change under discussion as unique and permanent.
4. Capital is mobile internationally unless all production is originally concentrated in the home country.

Perfect Competition

Economic theory divides the theory of the firm into two general types of market structures, pure and imperfect. Pure market structures consist of perfect competition and monopoly; imperfect, of monopolistic competition, oligopoly and oligopolistic competition.

The main features of perfect competition include a large number of firms selling a homogeneous product to a large number of buyers whose awareness of the market is all knowing. Neither individual sellers nor buyers are able to influence the market price by their individual actions. As a result, sellers are price-takers and face infinitely elastic demand for their product at a given market price, and buyers face infinitely elastic supplies at the same market price. An essential feature of perfect competition is the freedom of entry into and exit out of the industry in the short-run, due to more than or less than normal profits, respectively. In the long-run, however, this incentive is eliminated due to firm equilibrium being where market price equals average total cost (ATC). Without barriers to national or international trade one price must prevail in all markets for any particular commodity, otherwise incentive would exist for seller and/or buyer arbitrage.

Many Sellers from One Country

Of the many different combinations of sellers that can characterize the market for a commodity, only three apply to perfect competition: many sellers from one country (in this case the home country), many sellers from a few countries, and many sellers from many countries.

If the home country sellers are the sole world producers, all sellers would be confronted with the same change to their equilibrium as a result of a revaluation or devaluation by the

home country, and exchange rate changes must be analyzed as changes affecting the entire market, as opposed to changes affecting individual sellers. In the very short-run, export revenues[1] will vary in accordance with the exchange rate change, whereas revenues from domestic sales will remain unchanged. A devaluation will result in excess profits earned from export sales,[2] and a revaluation, losses, the extent of either depending on the importance of export sales to overall sales. A devaluation will provide incentives for existing firms to divert domestic sales to the export market and for new firms to enter the industry to service the export market, a revaluation will cause firms presently producing and exporting to quit the export market and concentrate sales efforts domestically.[3] In perfect competition

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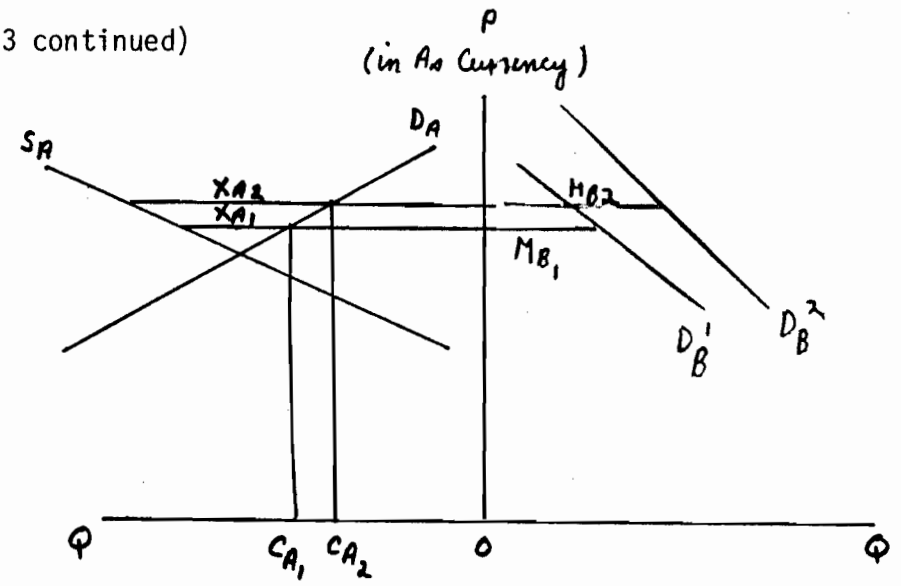
[1] Revenues to home sellers are always expressed, in this chapter, in terms of the home currency.

[2] In the very short-run an exchange rate change creates an arbitrage situation in which sellers already in an industry can earn excess profits (or losses) due to the temporary two-tier price arrangement: unchanged market prices in both domestic and foreign markets which are no longer equal due to the exchange rate change. As supplies are diverted from one market to the other, and as new sellers enter the industry the arbitrage opportunities diminish and eventually disappear, as one price must prevail in all markets for the same product.

[3] When perfect competition characterizes an industry at home and abroad and factors are immobile internationally a domestic devaluation will lead to a fall in domestic consumption, as domestic production is increasingly exported (and a domestic revaluation will lead to an increase in domestic consumption and a fall in exports, as production is increasingly diverted from exports markets to the domestic market). A domestic devaluation is illustrated below.

individual firms do not make these supply-switching decisions; the marketplace makes the decision for the firm who remains passive as to the nationality of the buyer. When exchange rates change, exports increase or decrease depending on the new relative market price of home exports to other internationally traded commodities.

(3 continued)



where, A = home country
B = rest of the world
X = exports
M = imports
1 = before currency change
2 = after currency change
C = consumption of exports

$X_{A_1} = M_{B_1}$

$X_{A_2} = M_{B_2}$

$C_{A_2} < C_{A_1}$

When there are no domestic sellers in the rest of the world D_{B_1} and D_{B_2} represent foreign demand before and after a home country devaluation. When sellers exist in the rest of the world they represent excess demand in the foreign markets.

Long-run equilibrium is only re-established when the export market price is equated to the unchanged domestic market price: one price prevails in all markets and neither excess profits nor losses are earned by all sellers (i.e. p = ATC). With a devaluation this occurs when the industry has expanded exports, due to the freedom of entry into the industry, sufficient to push the export market price down to the equivalent of the unchanged domestic price; and with a revaluation this occurs when the industry has contracted exports, due to the exit of firms from the export market and from the industry itself, sufficient to raise the export market price to the equivalent of the unchanged domestic market price. Until long-run equilibrium is re-established a devaluation will cause both the domestic price and the foreign price to be above their levels in the long-run.[1] Similarly, a revaluation will cause the domestic price to be below, and the foreign price below, their levels in the long-run.

Figure 3-1 shows the short-run effects of a devaluation . Sellers entering the industry and existing sellers whose sales are diverted to the export market to take advantage of excess profits to be earned from a devaluation cause the industry supply curve to expand to the point where the domestic price and the export equivalent return to P^E, long-run

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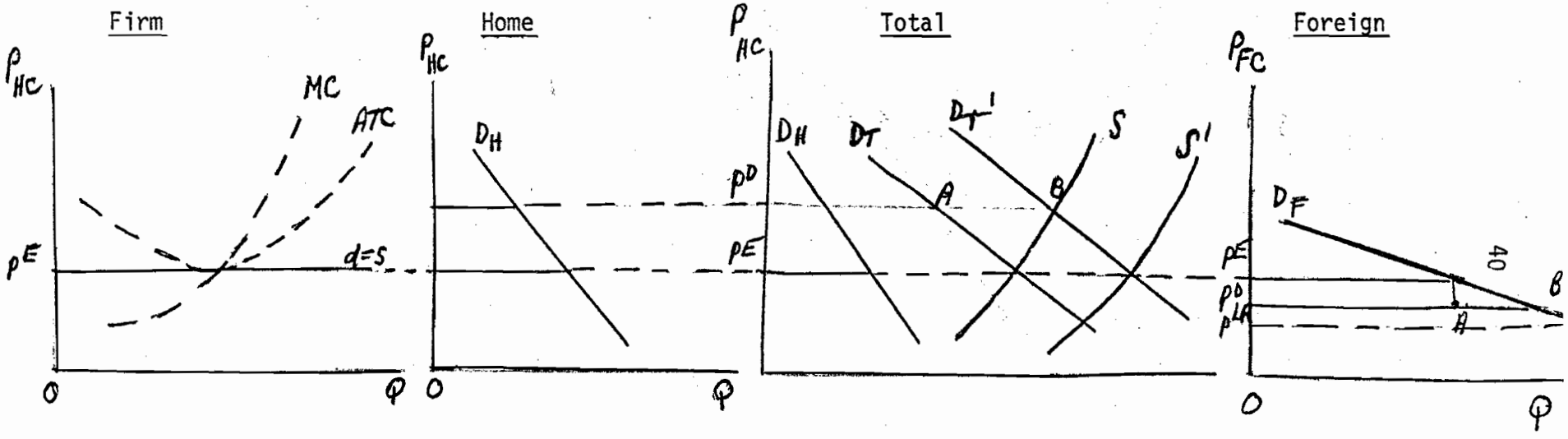
[1] In this discussion it is assumed that demand elasticity lies between zero and infinity.

Figure 3-1

Perfect Competition:

Many Sellers from One Country



where P_{HC}=price in home (domestic) currency

P_{FC}=price in foreign currency

P^E =equilibrium price

P^D_{LR}=price when home currency is devalued

P^{LR}= price in long-run in foreign market (=P^E in terms of home currency)

AB=increased demand in foreign market in short run (= decreased supplies to home market in short-run)

S_T= supply curve of home sellers

S'=supply curve in home market after devaluation, when new sellers enter market

D_T= total demand curve (= D_H+ D_F)

market equilibrium. The result of a devaluation is: expanded export volume at a market price equal to an unchanged domestic market price, and export revenues increasing by the full extent of the change in the exchange rate(taking into consideration the elasticity of the foreign demand curve). A revaluation will have the reverse effect, with volume diverted from the export market to the domestic market in the short-run and some sellers leaving the industry entirely in the long-run, and export revenues falling by the full extent of the change in the exchange rate (taking into consideration the elasticity of the foreign demand curve). Thus, the short-run results of an exchange rate change on the value of exports when all sellers are producing in and exporting from the home country will depend on the elasticity of demand in the export market.[1]

Many Sellers from Few Countries

If prior to the home country exchange rate change producers exist in other countries as well as in the home country, long-run equilibrium will depend on the relative importance of home country exports to both total home production and total foreign market sales, as well as on the demand elasticities in both markets. When home

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[1] Apart from the case where all production is concentrated in the home country, the analyses in this section do not mean to imply that a slight alteration in the exchange rate would cause a complete shutdown in the home production (revaluation) or expansion of home production to the exclusion of foreign production (devaluation). It is possible to theorize that a band exists both above and below the initial exchange rate level in which both domestic and foreign firms would continue to operate. The analyses in the present section assume that the exchange rate change that disturbs initial equilibrium takes the exchange rate outside of this band.

producers are an important factor in export markets the situation will resemble, in a modified form, the previous analysis; when home producers are an unimportant factor in export markets the analysis will follow the same logic but the long-run results will be more extreme. In both instances a home country devaluation will encourage home sellers to divert home sales to the export market and foreign producers (assuming capital mobility), to switch production[1] from their foreign base to the home country from where they will in turn export back to their own markets (i.e. the export market in our discussion). In the short-run, production will continue to exist in the export market as well as in the home country, with the home market price being above its long-run equilibrium level and the export market price being below long-run ATC for foreign producers but above the equivalent long-run ATC for home country producers.

In the long-run, all production will be based in the home country: home country exports will be considerably greater than initially since the home country will be the sole world producer; the home country market price will be unchanged from initial equilibrium; the export market price will be lower than initial equilibrium in terms of foreign currencies but will be equal to the equivalent of the home country price; and home country export revenues will expand

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[1] In theory, the costs of switching are considered minimal. In practice, production will be switched only if the potential benefits exceed the costs involved.

depending on the initial importance of home country exports to overall world demand. Such results are highly unreal yet logically follow economic theory and therefore must be noted.

The results of a home country revaluation will be the opposite of the above but will again resemble the results of the previous section. In the very short-run home exporters will divert sales from the export market (where price in terms of the home currency is less than ATC but is equal to ATC for foreign producers) to the home market where price equals ATC to home producers. This will continue until the home price falls below ATC due to continued outward movements in the home industry supply curve. At this point some domestic producers will quit the market altogether. However, in the long-run, unlike the analysis in the previous section where home sellers continue to produce and sell to the home market, now foreign producers exist and will capture the home market as well as the export market due to their ability to sell in the home market at the equivalent of the export market price level. As long as production can take place in foreign markets this production will force home producers out of business in the long-run; foreign producers are able to sell at a price that equals their ATC, which is below the home currency equivalent. As long as the disincentive of losses exist for home producers they will abandon the export market in the short-run and the home market as well in the long-run, forced out of both by foreign producers. Thus, the

results of a home country revaluation will be a cessation of home production in the long-run and a 100% reduction in the export revenues from the commodities subject to these market conditions, with home market price falling by the amount of the revaluation. Once again, these results are extreme and highly unrealistic given the history of international trade, yet they follow from the logic of economic theory.

Many Sellers from Many Countries

The case of many sellers from many countries is the extreme version of the previous section with the same unrealistic but logical results. Home producers will tend to be an insignificant force in the export market which in turn may or may not represent an important segment of home production. The reasoning is the same as previously explained but the transition from short-run disequilibrium to long-run equilibrium could be theoretically quicker. A home country devaluation will again result in home sellers expanding into export markets at the expense of their own domestic sales. New producers will begin production within the home market to service the export market. In the long-run, total world production takes place in the home country and export revenues grow by the full extent of worldwide sales (net of home sales).

A home country revaluation will again result in an exit of home sellers from the export market, with home sales expanding in the short-run. In the long-run, home producers must quit the

industry altogether because the home market price will always be below ATC due to the ability of foreign producers to export to the home market at their market price, which has not changed. As stated in the previous section, in the long-run home production ceases altogether, export revenues are reduced to zero, and the home market price falls by the amount of the revaluation.

In conclusion, within the framework of partial equilibrium analysis, when perfect competition characterizes international trade home producers/exporters continue to sell in both the home and export markets after a home currency exchange rate change if they were the sole world producers initially. In this situation a devaluation will expand worldwide markets, with new producers entering the industry within the home market to reap the excess profits derived from exports. In long-run equilibrium the foreign price will fall to equal an unchanged home price and export volume will increase due to sellers' incentive to expand supplies to reap short-run excess profits, in accordance with foreign demand elasticity. A revaluation will cause a contraction in export sales as firms try to minimize their losses. In long-run equilibrium enough firms leave the industry, especially the export market, to allow those remaining to earn normal profits. The foreign price will rise sufficiently to equal an unchanged home price, export volume falling in accordance with foreign demand elasticity.

In other situations in which foreign producers compete

with home producers a home currency devaluation will lead to sufficiently increased home production to supply the entire foreign market as well as the home market. In the long-run, foreign producers switch production entirely to the home market (assuming capital mobility) and the foreign price falls to equal an unchanged home price, in accordance with foreign demand elasticity. A revaluation will force home producers to cease production (or switch production to the foreign market) to avoid losses. In the long-run,world demand is supplied from production in foreign markets with the home price falling sufficiently to equal an unchanged foreign price.

Regardless of the location of sellers any change in export volume is due to the marketplaces' influence on sellers. With a home devaluation sellers are persuaded to increase exports as a result of the temporary extra profits to be earned. With a home revaluation sellers are persuaded to decrease exports as a result of the losses that would be incurred. Initially market prices are unchanged. In the long-run,market prices change as quantity supplied increases or decreases. In the long-run, therefore, demand elasticities are important in determining the extent to which the export market expands with a home devaluation, or contracts with a home revaluation (but only as a secondary influence). The primary effect of exchange rate changes on export volume and on the balance of trade is supply oriented, dependent on the reaction of sellers to changes in their profitability in both the home and export markets.

The traditional partial equilibrium approach gives unorthodox results. To save traditional theory we must employ general equilibrium analysis, yet in so doing we become involved in a more complex situation, that of demand curves that are more difficult to handle than those discussed within the context of partial equilibrium.[1] In analyzing the price elasticity approach to balance of trade partial equilibrium means ceteris paribus assumptions with regard to the other variables normally included in general equilibrium demand curves. Introducing general equilibrium conditions implies the necessity of analyzing demand curves in which price is but one variable affecting the demand for exports.

Monopoly

Monopoly power exists when there is only one seller in a well-defined industry. The demand curve facing the industry is the demand curve confronting the firm. A profit maximizing monopolist equates marginal revenue with marginal cost in determining market price and quantity. A price discriminating monopolist equates the combined marginal revenues from each separate market with overall marginal costs in determining a separate price and quantity for

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[1]See Milton Friedman, "The Marshallian Demand Curve," Journal of Political Economy, 57 (1949), 463-495; Martin J. Bailey, "The Marshallian Demand Curve," Journal of Political Economy, 62 (1954), 255-261; and Milton Friedman, "A Reply," Journal of Political Economy, 62 (1954), 261-266.

each market.[1]

Unlike the previous analysis of perfect competition, the supply curve of the monopolist is unspecified, with output represented by a point defined by the intersection of the marginal revenue and marginal cost curves, which, in conjunction with the demand curve, specifies market price. Any disturbance to the monopolist's variable costs would be reflected in the price he charges for, and in the quantity he supplies of, the product he produces.

Analysis of monopoly as a market structure is simplified, since the only case to analyze is that involving one seller located in one, or more than one, country. As in the case of many sellers from one country under perfect competition, only when the commodity involved is produced and exported by a monopolist, some of whose production is located in the home country, will a home currency exchange rate change affect home commodity exports.

To the export market, a home currency devaluation is the same as a fall in the market price (in terms of the foreign currency). Foreign demand will increase since it is denominated in terms of the foreign currency, which, to the home monopolist, is interpreted as an upward shift in the export market's demand curve (in terms

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[1]The effect of anti-dumping legislation on a discriminating monopolist's behavior is not considered, since this would be adding a parameter that is not generally admitted by economic theory when analyzing monopoly as a market structure.

of the home currency). Prices will rise in all markets in terms of the home currency, not only in the export market (assuming that all monopolists are discriminating), since now MC = MR at a higher level. This is shown in figure 3-2: both the volume and value of exports increase (in terms of the home currency) and home sales fall.

To the export market a home currency revaluation is the same as a rise in the market price (in terms of the foreign currency). Foreign demand will decrease, which, to the home monopolist, is interpreted as a downward shift in the export market's demand curve (in terms of the home currency). Prices will fall in all markets, since now MC = MR at a lower level. The volume and value of exports fall (in terms of the home currency) and home sales increase.

A home devaluation will induce the monopolist to divert volume from the home market to the export market. If the monopolist is located only in the home country, he will expand home production to supply the now more profitable export market. If the monopolist is located in a foreign country only or in a foreign country as well as the home country,[1] he will be induced to switch all production from the foreign country to the home country and

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[1]This case could include a multinational cartel instead of a multinational monopolist, as long as the cartel acts in the same manner as a discriminating monopolist.

export from the home country. In either case home exports will expand. A home revaluation will induce the monopolist to divert volume from the export market to the home market. If the monopolist is located in a foreign country only, home exports are not affected (as they were zero initially). If the monopolist is located in the home country only or in the home country as well as in a foreign country, he will be induced to switch all production from the home country to the foreign location and export from there to the home country. In either case home exports will fall to nothing.[1]

If exports are important relative to total output and the export market demand curve is elastic, the analysis as shown in figure 3-2 is most likely to result from home currency exchange rate changes: a home currency devaluation will lead to increased prices (in terms of the home currency), higher export volume, and to an increased value of exports as the result of production being switched entirely to the home country, and to lower home sales; a home currency revaluation will lead to decreased prices (in terms of the home currency), no export volume as the result of production being switched entirely to a foreign location, and to higher home imports. If exports are not important and the home demand elasticities

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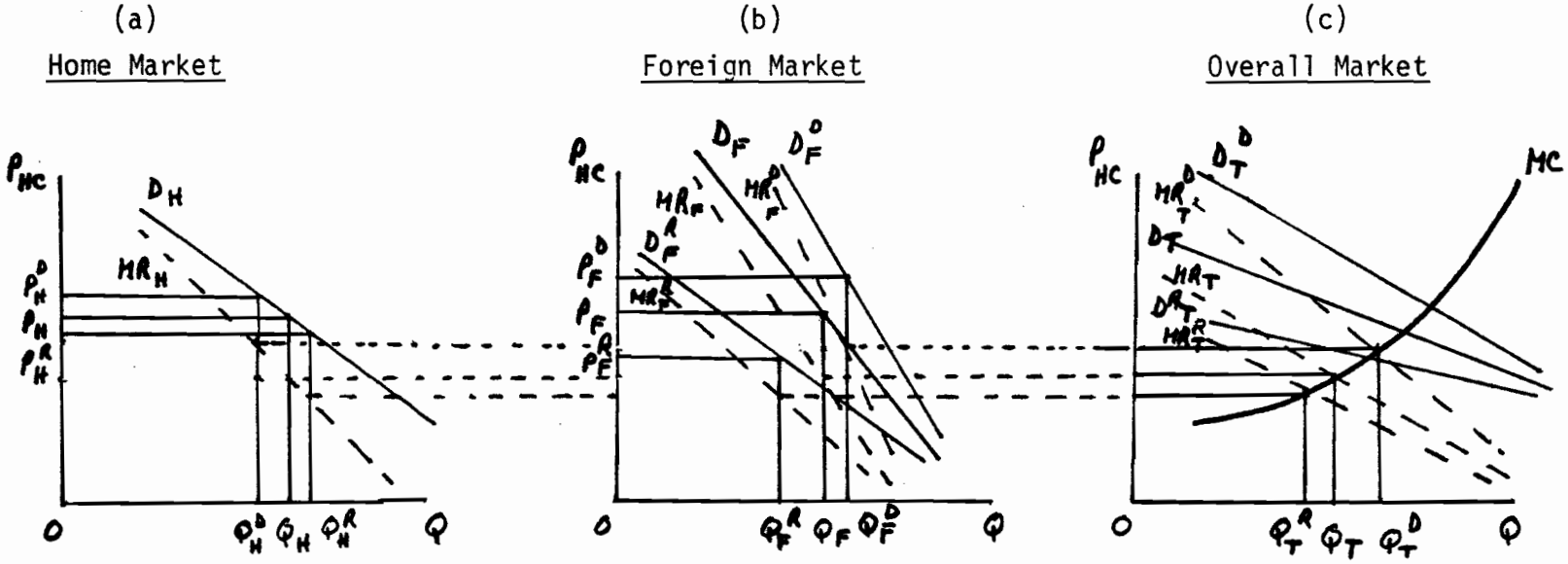
[1] In this argument I ignore the effects of transportation costs on a multi-plant monopoly. The above analysis is not meant to imply that a slight alteration in the exchange rate would cause a complete shutdown in the home production (revaluation) or expansion of home production to the exclusion of foreign production (devaluation). See footnote 1, page 41, above.

Figure 3-2

Monopoly



In addition to the explanations for symbols given in figure 3-1 above:

sub-suffix H refers to the home or domestic market
sub-suffix F refers to the foreign or export market
sub-suffix T refers to the total market (home and foreign combined)
supra-suffix D refers to a home devaluation
supra-suffix R refers to a home revaluation
D = demand
MR = marginal revenue
MC = marginal cost

are not sufficiently low, the results of a home currency exchange rate change would be ambiguous, with almost any results possible.[1]

Monopoly is conceivable as a market structure in analyzing the effects of an exchange rate change on commodity exports because the seller controls market prices and is able, in theory, to earn excess profits. As in the case of perfect competition, export volume changes, initially, as the result of the seller's reaction to a change in his profits resulting from the exchange rate change; foreign demand elasticity is of secondary importance, reinforcing the action of the monopolist. In reality, however, pure monopoly rarely exists, even if all producers from one country are grouped together and considered as one seller in international markets (as in the case of perfect competition when all sellers reside in one country). There is not a single instance of a widely consumed product produced by one firm (although there are a number of products in which individual countries have near monopoly power in world export markets[2]). Added to this is the general availability

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[1]When exports are unimportant, home currency exchange rate changes will have little effect on home market prices and sales since market prices are denominated in the seller's currency (in this case, the home currency). In the extreme, the foreign market is entirely eliminated (exports are nil to begin with) and a home currency exchange rate change leaves the home market price and sales unchanged. When exports exist, a home currency exchange rate change affects the home market price and the export market price, as described in the text. The more important are exports in relation to home sales, the greater will be this effect and the closer the results will resemble those described in the text. In addition, the more elastic is the home market demand curve the less will a home currency exchange rate change affect home price and sales.

[2]See table 4-3, chapter 4 for those products in which Canadian producers are in this position.

of close product substitutes for almost all commodities. Therefore, the value of exports produced by monopolists can never be significant, remaining a theoretical curiosity in analyzing the effects of an exchange rate change on the value of exports and on a country's balance of trade.

Monopolistic Competition

Pure market structures, discussed above, are theoretical abstractions and, therefore, not empirically observable. Both perfect competition and monopoly are theories that analyze markets without the existence of rivals. Therefore sellers do not have to concern themselves with the behavior of their competitors. Reality lies somewhere between the extremes of perfect competition and monopoly, where, in theory, there are an infinite number and no competitors, respectively. Monopolistic competition combines certain characteristics of both pure market structures and is discussed below, while oligopoly and oligopolistic competition, the other imperfect market structures, are discussed in the section that follows.

Monopolistic competition differs from perfect competition in that product differentiation characterizes the numerous firms comprising a product group as opposed to a homogeneous product produced by numerous firms comprising a competitive industry. In both cases there are a large number of firms in the market and each

firm expects his actions to go unnoticed by the others. The similarity with monopoly lies in the fact that each firm possesses some degree of monopoly power due to the existence of product differentiation. Although the product of each firm differs, either materially or symbolically, from all the others in a product group, all firms in the product group produce closely related, and readily substitutable commodities.

A main feature of monopolistic competition is that it is essentially a long-run theory. Like perfect competition there cannot be other than normal profits[1] in the long-run. Although the demand curve facing the firm is negatively sloped (as in monopoly), it is tangent to the firm's long-run average cost curve in the long-run, when price equals LAC, due to the free entry of competitors, attracted to the product group by the existence of short-run profits. This feature is of prime importance when monopolistically competitive firms trade internationally.

> The crucial distinguishing assumptions [of the long-run equilibrium position of a monopolistic competitor] are that monopolistic competitors are small relative to the market for their general class of differential products, and that entry into the market is free. Then if positive profits are earned, new firms will squeeze into the industry, shifting the typical firm's demand curve to the left until, in long-run equilibrium, it is tangent to the firm's long-run unit costs of long-run average total cost.[2]

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[1]Under monopolistic competition normal profits include a degree of monopoly profits due to product differentiation.

[2]F.M. Scherer, Industrial Market Structure and Economic Performance (Rand McNally & Company, Chicago, 1970), 14-15.

As in the case of perfect competition, sellers compete in export markets with many other firms producing easily substitutable products. Therefore, they are forced into being price takers, in the same way that all firms in a perfectly competitive market structure are price takers because they sell a homogeneous product.

Many Sellers from One Country

As in the case of perfect competition, the different combinations of sellers that can characterize the market for a commodity are many sellers from one country (in this case the home country), many sellers from a few countries and many sellers from many countries.

If the home country sellers are the sole world producers all sellers would be confronted with the same change in their equilibrium as a result of a revaluation or devaluation by the home country and exchange rate changes must be analyzed as changes affecting the entire market as opposed to changes affecting individual sellers. In the very short-run, export revenues will vary in accordance with the exchange rate change, whereas revenues from home sales will remain unchanged. A devaluation will result in excess profits being earned from export sales, and a revaluation, losses, the extent of either depending on the importance of export sales to overall sales. A devaluation will provide incentive for existing firms to divert home sales to the export market and for new firms

to enter the product group to supply the export market; a revaluation will cause firms presently producing and exporting to quit the export market and concentrate sales efforts domestically.

In the short-run, a home currency devaluation would have the same effect on the revenues of each producer as would an upward shift in the export demand curve. That is, home currency revenues from export sales would be greater, allowing sellers to earn more than normal profits. In order to expand volume sellers would be encouraged to lower export prices and new entrants would be attracted to the product group in the home country to earn abnormal profits from export sales. By similar reasoning, a revaluation would have the same effect on the revenues of each producer as would a downward shift in the export market demand curve facing each producer: home currency revenues from export sales would be less after the exchange rate change, and sellers would earn less than normal profits. In order to maintain normal profitability in their export markets sellers would attempt to raise export prices. Some sellers may abandon the export market altogether to concentrate their sales efforts in the profitable home market. The extent of the change in revenues from exports depends on the importance of the export market sales volume relative to total sales and on the elasticity of foreign demand: the less important the export market and the less elastic foreign demand the less will export revenues change; the higher the proportion of export sales volume to overall

volume and the more elastic foreign demand the more will the changes in revenues approximate the proportionate change in the exchange rate.

Long-run equilibrium is only re-established when the export price (in terms of the home currency) equals the home price (as in theory only one price can prevail in all markets for the product group) and when all sellers within the product group are earning normal profits (that is, at $\bar{A}$, or its equivalent, in figure 3-3). At $\bar{A}$ the demand curve facing the individual producer (dd) is tangent to his long-run average cost curve so that he is just earning normal profits in all markets. There is no incentive for new producers to enter the product group or for present producers to leave the market. $\bar{A}$ is market and seller long-run equilibrium with unchanged costs. Until long-run equilibrium is re-established, a home currency devaluation will mean that price (in terms of the home currency) will be above its long-run level; similarly, a home currency revaluation will mean that price (in terms of the home currency) will be below its long-run level.

The results of an exchange rate change on the value of exports when all sellers are producing in, and exporting from, the home country are the same[1] as the results when the markets are

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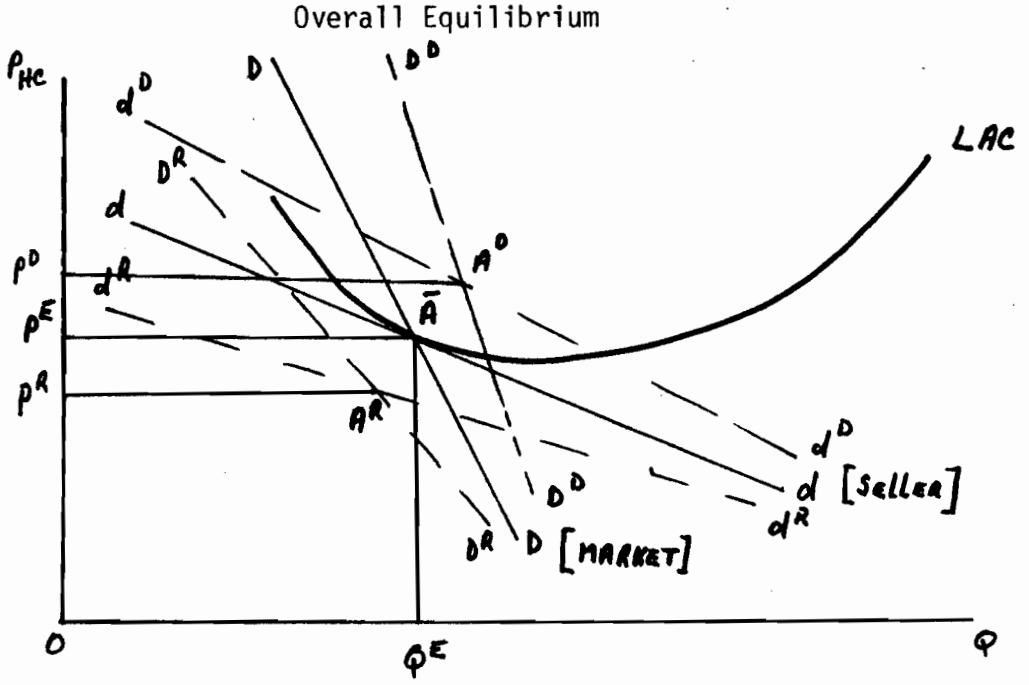
[1]Theoretically, there would be a time lag between equilibrium before and after the exchange rate change under monopolistic competition conditions, whereas the adjustment would be instantaneous under perfect competition.

Figure 3-3[1]

Many Sellers from One Country:
Monopolistic Competition



where, d refers to demand facing individual sellers,
D refers to market demand,
A refers to the intersection of seller and market demand curves,
Q^E refers to quantity sold under equilibrium conditions, and
LAC refers to long-run average cost.

For explanations of other symbols, refer to figures 3-1 and 3-2.

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[1]To avoid unnecessary crowding, marginal cost and marginal revenue curves have not been drawn in. As in the case of the other market structures discussed in this chapter, equilibrium exists where marginal cost and marginal revenue are equal, both for individual sellers as well as for the industry as a whole.

similarly characterized by perfect competition. Depending on the importance of the export market, the value of exports will increase with a devaluation and decrease with a revaluation in accordance with the elasticity of demand in the export market. Here the effect is due to sellers' actions initially and only afterward to buyers' reactions to any supply oriented price changes that result.

Many Sellers from Few Countries and
Many Sellers from Many Countries

If prior to the home country exchange rate change sellers exist in other countries as well as in the home country the effect of a home country exchange rate change on home exports and balance of trade will again parallel those derived under similar seller combinations and perfect competition. Therefore a detailed analysis will not be given but the results will be summarized. The results, however, are equally unrealistic but follow the logic of economic theory.

Assuming capital mobility a devaluation will encourage home sellers to divert home sales to the export market, new producers to enter the industry and foreign producers to switch production from their foreign base to the home country from where they will in turn export back to their own markets. In the short-run, production will continue to exist in the export market as well as in the home country, with the home market price being above its long-run

equilibrium level and the export market price below long-run ATC for foreign producers but above the equivalent long-run ATC for home country producers. In the long-run, all production will be based in the home country (as under perfect competition) as profit-maximizing foreign producers within a product group are lured into producing in the home country and exporting back to their domestic markets due to the excess profits to be earned. Home export volume and revenues will increase as world markets are supplied by producers based in the home country, the increase directly dependent on the initial importance of home country exports to overall world demand.[1]

The results of a revaluation in the short-run will be the diversion of sales by home sellers from the export market to the home market in their efforts to avoid less than normal profits from exports. This will continue until the home market price falls below long-run ATC. As foreign sellers will still be earning excess profits (in terms of their foreign currencies) from sales to our home market, home sellers will be forced out of all markets. In the long-run, home production will cease and export volume and revenues will fall to nothing in the industries affected.

The effects of home currency exchange rate changes on both home export volume and revenues when monopolistically competitive conditions characterize international trade are similar to those

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[1]Equilibrium could be reached before complete specialization is achieved depending on the degree of monopoly power in a particular product group.

previously discussed under perfect competition. Sellers can afford to temporarily absorb the loss of monopoly profits involved in the devaluation (foreign producers) or revaluation (home producers). Eventually, however, sellers must give way to their profit-maximizing behavior. In the long-run, sellers not earning normal monopoly profits will divert their production facilities into areas where such profits can be earned. With a home country devaluation total world production will be based in the home country; with a home country revaluation total world production will be based in countries other than the home country. Again the effects of home currency exchange rate changes on the volume of home exports is supply oriented, based on the initial action of sellers to any change in their profits.

Oligopoly and Oligopolistic Competition[1]

> In December 1971, in response to a worsening trade deficit, the U.S. devalued the dollar 11%. According to traditional theory this should have stimulated lagging U.S. exports because U.S. goods would become more attractive for foreign consumers. The balance of trade would be further helped by the corresponding rise in the price of imports in the U.S. since, presumably, demand would fall. But things did not work out according to plan. The real volume of exports, except for agricultural goods, did not rise perceptibly. Foreign-based global corporations exporting to the U.S. and the overseas subsidiaries of U.S. global firms, fearing the loss of their share of the American market, did not raise prices to the extent anticipated. As oligopolists, they could afford to trim their profit margin of the moment to assure long-term stability of their market shares. Thus

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[1] Oligopolistic competition expands the market concept of oligopoly by including an oligopolistic attitude, by many firms, in industries characterized by monopolistic competition.

> the power of global oligopolies to set prices irrespective of market forces frustrated the intended effect of the devaluation because of their command of so much of world trade.[1]

Of the market structures discussed in this chapter, it is only when firms are operating within an oligopolistic market structure that they are able to operate according to traditional economic theory in the long run, given changing exchange rates. This is because oligopoly distinguishes itself from the other market pricing theories previously discussed by the number of sellers in an industry (or product group[2]), by the attitude of each firm to the pricing decisions of the others, and by the relative profitability of competing firms.

"The importance of market structure lies in the way it induces firms to behave.... Market conduct consists of a firm's policies toward its product market and toward the moves made by its rivals in that market."[3] The number of sellers making up an oligopolistic industry is secondary to the reaction firms have to each other's pricing policies as well as to the individual profitability of each seller. Firms recognize that they are interdependent, that competition cannot be impersonal as it is in perfect competition and monopolistic competition. Thus, each seller must take into

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[1] Richard J. Barnet and Ronald E. Müller, Global Reach (Simon & Schuster, New York, 1974), 287.

[2] In the discussion that follows industry is used to mean product group as well.

[3] Richard Caves, American Industry: Structure, Conduct, Performance (Prentice-Hall, Inc., New Jersey, 1967), 37.

consideration the reaction of all rivals when making decisions, particularly pricing decisions.

> When either pure competition or pure monopoly prevails, there exist clear-cut solutions to the firm's price and output decision problem, assuming only that managers seek to maximize expected profits and that they hold definite (though probabilistic) expectations concerning future cost and demand conditions. With rivalry among the few, however, this is not so. Each firm recognizes that its best choice depends upon the choice its rivals make. The firms are interdependent, and they are acutely conscious of it. Their decisions depend then upon the assumptions they make about rival decisions and reactions, and many alternative assumptions might be entertained.[1]

According to Scherer anything can, and does, happen. Oligopolists try to set prices as though they were monopolists but can also be observed to indulge in bitter price warfare where the market price temporarily falls below a perfectly competitive market price. "The most that can be hoped for is a kind of soft determination: predictions correct on the average, but subject to occasionally substantial errors."[2]

Jacoby, on the other hand, believes that even markets dominated by a few large firms are highly competitive, because of a multi-vectored dynamic process. According to the theory of dynamic competition, modern industry is characterized by intra-product and inter-product competition, as well as by international and potential

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[1]Scherer, op. cit., 131.

[2]Ibid., 132.

competition from both additional sellers and products.[1] The effects of dynamic competition on sellers' behavior is to eliminate oligopolistic rivalry and interdependence. Jacoby states that the "measurement of the effectiveness of competition in a market requires an assessment of all vectors, and a summation of their competitive effects".[2] Prices should not be the sole criterion for assessing the strength of market competition. However, if one accepts Jacoby's assessment of markets, we are left with a situation in which sellers have little control over the prices of their products. My previous analysis, regarding the effects of changing exchange rates on competitive market structures, would then apply to Jacoby's markets, with the same unrealistic results. Therefore, when markets are characterized by high seller concentration, the analysis stated below, using oligopolistic theories and yielding realistic results that can be used in empirical research, would appear to apply to the marketing of internationally trading commodities subject to changing exchange rates.

Underlying the overall theory of oligopoly is the concept that the individual seller's demand curve is generally not known. The theories exploring oligopolistic behavior do not concern themselves with the seller's demand curve itself. They are concerned, rather, with the position of a firm as regards price, vis-a-vis the

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[1] Neil H. Jacoby, Corporate Power and Social Responsibility (MacMillan Publishing Co. Inc., New York, 1973), 139-144.

[2] Ibid., 140.

prices of its competitors; and in particular with the pricing policy of firms with regard to changes in both their own costs and the prices of their competitors. Thus it is theorized that sellers employ any means other than price to increase sales,[1] with costs and profits the variables and price a parameter.

Because the individual oligopolist's demand curve is undefined, it is generally impossible to hypothesize on buyer reaction to price changes. Since it would therefore be impossible to estimate the elasticity of demand facing individual sellers in the markets for their products, it would also be difficult to estimate the effect of a theoretical price change, brought about by an exchange rate change, on the value of a country's exports and on its balance of trade. If markets for internationally traded commodities are dominated by oligopolistic industries, the applicability of the theory of price elasticity would be devoid of practical meaning.

Since oligopoly theory revolves around the behavior of the sellers and their ability to influence markets and assimilate the effects of price changes,it becomes the only market structure theory, other than monopoly, to arrive at a long-run market and seller equilibrium (other than the unrealistic results obtained in

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[1]Although, as previously noted, price wars are not unknown, they represent the exception in the behavior of oligopolists and are generally short lived.

the analyses of perfect and monopolistic competition above). The theory of both perfect and monopolistic competition imposes solutions on individual firms. In so doing, these theoretical market structures fail to allow the re-establishment of general equilibrium, with all sellers in all markets, once the market has been disturbed by a home currency exchange rate change, without the unrealistic results discussed previously. By obscuring the relationship between the firm's demand and cost curves and by permitting profit fluctuations without requiring price adjustments oligopolistic firms can theoretically absorb the effects of exchange rate changes. Oligopoly allows long-run equilibrium to be re-established with the possibility of all firms selling in all markets.[1]

Few Sellers from One Country

Firms that make up an oligopoly can reside in the home and/or foreign countries. If they all reside in the home country, a home currency devaluation will have the effect of an upward shift in the demand that oligopolists face in export markets, and a home currency revaluation will have the effect of a downward shift in export demand. Under perfect and monopolistic competition a devaluation would lead to increased exports due to lower export prices (in terms of foreign currencies) while at the same time, home

[1]The discussion that follows will not use diagrams due to the undefinable nature of the demand curve facing the oligopolist seller and to the theoretical analysis of oligopoly in terms of seller behavior.

producers would divert supplies to the more profitable foreign market. A revaluation would lead to decreased exports due to higher export prices (in terms of foreign currencies) while at the same time, home producers would divert supplies to the more profitable home market. However, the essence of oligopoly behavior is that oligopolists take into account the reaction of their competitors to all their decisions, including pricing decisions.

If a seller is unaware of the position of the demand curve facing his product (as previously discussed), he will also be unable to assess the effects of the shift in export demand caused by an exchange rate change. Thus, the seller will not know to what extent a price change might affect his exports. At the same time, being oligopolists, sellers will not change their prices except when other sellers follow suit. When all sellers reside in the home country, all sellers are faced with the same disturbance and it is therefore most likely that export prices will remain unchanged (in terms of foreign currencies) with a home currency devaluation, leading to each seller earning greater profits from his exports and, therefore, concentrating his sales efforts in the export area. It is also likely that export prices will be raised (in terms of foreign currencies) as a result of a home currency revaluation so that each seller can maintain his current level of profits. However, neither result is certain. Each of these suggested outcomes arises from the fact that all sellers face the same pricing decision caused by the home currency exchange rate

change. However, oligopoly theory maintains that each seller will anticipate the reactions of its competitors to his own behavior and is unlikely to upset overall equilibrium except when he believes that his competitors will follow his lead. When all sellers reside in the same country they would recognize that their acting in concert, as though they were a monopoly, would lead to profit maximization for each seller. However, they would then have to know the industry demand curve in both the export and home markets to decide what action to take with respect to both price and sales efforts. Thus, the results when all sellers reside in the home country would be similar to those derived within monopoly theory: oligopolists would act as though they were discriminating monopolists in all markets in order to maximize overall profits.

Few Sellers from Few Countries[1]

The more general form of market structure is characterized by many sellers residing in many countries (which, in oligopoly, must be translated into few sellers residing in few countries). In the case of oligopoly, the results are essentially unchanged from the previous section. Oligopolistic sellers in both the home and foreign markets are compatible with long-run equilibrium because under oligopoly price competition is all but eliminated.

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[1]The most recent edition of Kindleberger's text book includes a discussion of this case. See Kindleberger and Lindert, op. cit., 282-283.

The theoretical price effects of a home currency exchange rate change will not disturb market equilibrium regardless of where sellers reside.

When oligopolists reside in few countries, a home currency exchange rate change affects only that part of the industry residing in the home country (except for the exports of other sellers to the home country). Under these circumstances, it is even less likely than when all sellers resided in the home country that there will be any effect on market prices. In theory, any price effect resulting from an exchange rate change would depend on whether or not a majority of seller power were affected by the exchange rate change. However, even then the results would be open to question. It is unlikely that oligopolists would act like discriminating monopolists, as speculated in the previous section, unless an overwhelming majority of the power in the industry resided in the home country and were thereby affected.

Most oligopoly theories state that when some firms in the industry are affected by a change in a variable that has a direct bearing on price, either those affected absorb the effect in their profits or all firms in the industry adjust their prices in the same fashion. No individual or group of sellers will act on its own without regard for other sellers in the industry. Therefore, a home currency exchange rate change will not affect market prices unless all sellers decide to adjust their prices in the same manner. Under these circumstances the effect of a home currency exchange

rate change on market price, and the theoretical effect of price on demand, are unknown prior to the exchange rate change. It can only be speculated that the greater the proportion of the industry power directly affected by any exchange rate change the greater is the likelihood that the industry as a whole will act as though it were a discriminating monopolist, and the effects of a home currency exchange rate change on exports will be similar to those as analyzed under monopoly.

Oligopoly as a theory characterizing international trade resembles reality since all sellers can sell in all markets despite an exchange rate change. It is a general equilibrium theory both for individual sellers and for the industry as a whole since it provides for equilibrium in both the short-run as well as the long-run. In this respect, it is the only market structure theory in which both individual sellers and the industry absorb the effects of exchange rate changes and market equilibrium exists at the same time. Since it is a theory that speculates on the behavior of sellers, changing exchange rates presents a problem that must be analyzed on a commodity-by-commodity basis and on a country-by-country basis, for the exports of any particular country. The effects of changing exchange rates on commodity exports for a particular country cannot be determined a priori.

Modern oligopoly theory starts with Chamberlain.[1] According

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[1] E.H. Chamberlain, The Theory of Monopolistic Competition (Harvard University Press, Cambridge, 1933).

to Scherer, the main impact of Chamberlain's analysis was to show that when sellers are few and products standardized, a monopoly price can be established without formal collusion.[1] Each firm recognizes their mutual interdependence and finds that monopolistic pricing is best. Chamberlain assumed a duopolistic market in which each firm has an identical cost function. "...(W)hen cost functions and/or market shares vary from firm to firm within an oligopolistic industry, conflicts arise which, unless resolved through formal collusive agreements, interfere with the maximization of collective monopoly profits; and if left unresolved, these conflicts may trigger myopic, aggressive behavior which drives the industry far from the joint-profit maximizing solution of its price-output problem."[2]

In the sections that follow, several of the more general theories concerning oligopolistic behavior are presented in order to gain greater insight into the reactions of individual sellers to changing exchange rates, and in this manner determine the possible effects of changing exchange rates on the demand for, and value of, commodity exports.

Sweezy's 'Kinked' Demand Curve[3]

Perhaps the most notable theory on the behavior of oligopolists is Sweezy's theory of the 'kinked' demand curve. Sweezy's

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[1] Scherer, op. cit., 136.

[2] Ibid., 140.

[3] Paul M. Sweezy, "Demand Under Conditions of Oligopoly," Journal of Political Economy, 47 (1939), 568-578.

diagram is reproduced in figure 3-4 where it is assumed that the oligopolist "knows" the demand curve he faces (although, as discussed above, this assumption is a subject of speculation).

A home currency revaluation would cause a Sweezy-type firm to loose substantial foreign market sales if, as a consequence, the firm were to operate on the elastic portion of its 'kinked' demand curve (to the left of A) where competitors' reactions would be to maintain prices. A home currency devaluation, involving a potential fall in a seller's export price, would entail only a small increase in export sales if it involved his operating on the inelastic portion of his 'kinked' demand curve (to the right of A) where competitors' reactions would be to follow his lead as regards price. Obviously, it is to the advantage of the oligopolist to maintain his export price (or to follow the price leader in any price changes), regardless of the home currency changes, absorbing the loss of profits following a revaluation and enjoying the additional profits as the result of a devaluation. Scherer mentions that this is consistent with observed behavior and that in industries with few sellers and homogeneous products interviews with businessmen revealed the general belief that price-cutting would be matched, forcing all firms into the AD area of their demand curve.[1]

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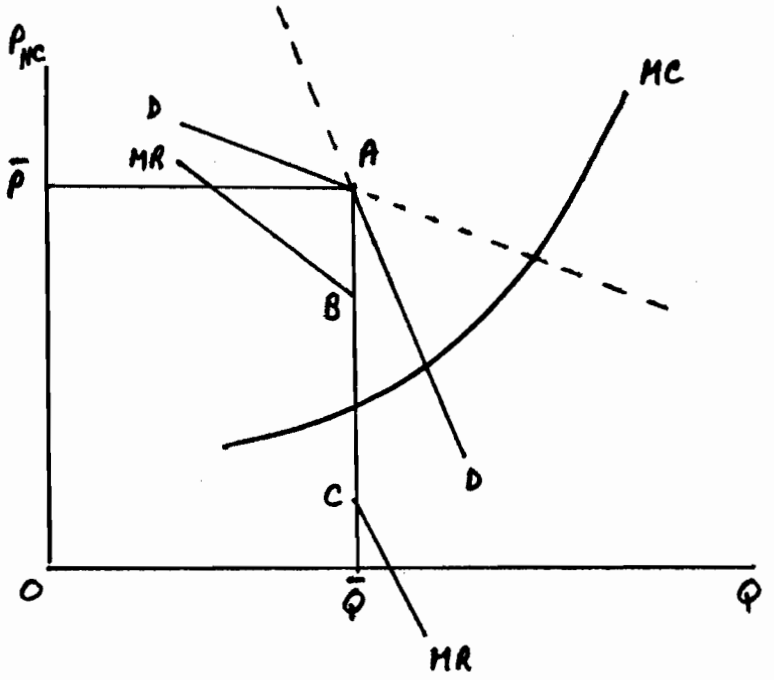
[1]Scherer, op. cit., 147.

Figure 3-4

Sweezy's 'Kinked' Demand Curve



The crucial feature of an oligopoly, whether it be an industry comprising just a few firms or one characterized by monopolistic competition, is that participating firms have an overriding concern about the reaction of competitors and potential competitors to their own pricing policies and that this concern dominates their pricing policies. However, oligopolists operating within a Sweezy-type market structure need not concern themselves about the consequences of home currency exchange rate changes as long as they maintain their price at the 'kink' in their demand curve (at A in figure 3-4). At this point, they continue to maximize profits by equating marginal revenue with marginal costs (between B and C in figure 3-4) without changing their prices. Their optimal behavior is to leave their export prices unchanged and absorb the exchange rate change in their profits. Both pre-exchange rate change price ($\bar{P}$) and export volume ($\bar{Q}$) are equilibrium positions both before and after the exchange rate change. Of course, in industries where price leadership is important the 'kink' is eliminated since all firms follow the leader's action on price, both upwards and downwards.

Such inaction, however, nullifies the theoretical intention of exchange rate changes, that is, that exchange rate changes are effected to influence the demand for exports and thereby change net foreign exchange revenues. If prices do not change, the theoretical arguments of demand price elasticity are empty of practical meaning.

Monopoly Power[1]

One of the more significant and directly applicable (concerning Canadian commodity exports) oligopoly theories involves the concept of country monopoly power. Essentially, the less the total market price elasticity of demand for a commodity exported by a particular country the greater is the monopoly power of this country in the export markets concerned. Harberger suggests that "an elasticity of (world) export demand of -2 implies that the country in question has substantial monopoly power"[2] and could, in the absence of retaliation, benefit from a 100% export tax. He believes that no country possesses this degree of monopoly power in the long-run. However, the results of the price elasticity studies cited in chapter 2, table 2-2, do not entirely support Harberger's belief. Most of these studies concluded that the pertinent demand elasticities were less than -2 for every group of commodities with the exception of end products for which the results were mixed. However, supply elasticities were not calculated into these results and most of the regressions noted involved the demand of individual countries for individual commodities rather than world demand for a single commodity.

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[1] Monopoly power is basically an institutionalized version of my previous analyses of the effects of home currency exchange rate changes when all sellers reside in the home country.

[2] Harberger, op. cit., 521. According to Harberger it requires a combination of low elasticity of consumer demand for a commodity plus low supply elasticity of other producers to achieve monopoly power. He cites Brazil and its coffee exports as such an example.

Horner carries Harberger's theory further by including in his definition of monopoly power the proportion of the export market supplied by the exporting country. "Where the exporting country supplies a more than negligible part of its export market it can be readily seen that the price elasticity of export demand for its own product will be less than the price elasticity of demand in the export markets for the commodity in general by an amount dependent on the portion of that market it supplies."[1] Harberger's citation of Brazilian coffee exports is an example of possible monopoly power according to Horner. De Vries confirms Horner's statement. "Commodities whose imports supply a relatively large share of the U.S. market tend to have a relatively low elasticity of import demand; while commodities whose imports supply a relatively small share of the market have relatively high elasticities,"[2] implying foreign producer monopoly power in U.S. commodity markets for the former and, therefore, a more steeply sloped U.S. consumer demand curve.

These statements would indicate that those Canadian producer/exporters who supply an important proportion of both world production and specific export markets could wield monopoly power,

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[1]Horner, op. cit., 326. "At one extreme, a country with a world monopoly of the commodity simply faces the demand curve of the world market. At the other extreme, a country supplying a negligible proportion of a free export market faces a demand curve of perfect elasticity, that is, elasticity of minus infinity".

[2]De Vries, op. cit., 413.

giving them the power to pass on the additional costs accompanying a Canadian dollar revaluation but allowing them to absorb the benefits arising from a dollar devaluation. Tables 4-12 and 4-27 in chapter 4 indicate such Canadian dominance over specific commodities exported to the U.S. and the U.K., respectively; while table 4-3 indicates the degree of Canadian world monopoly power over specific commodities, based on the proportion of Canadian exports to total world exports. Commodities included cover almost 50% of the value of Canadian exports. In Japan and the U.S., in particular, Canada is the major supplier of commodities comprising, in value, the bulk of Canadian exports to these markets (very often for the same exports to both markets). This, to paraphrase Harberger, Horner and de Vries, could give Canadian exporters a degree of monopoly power over individual exports and in export markets important to the overall growth of Canadian exports. However, supply elasticities of other producers must be calculated and their effects must be used in any calculation of Canadian monopoly power over any specific commodity.

Stable Export Prices and Export Market Shares

By far the most prevalent pricing policy mentioned in the surveyed literature was corporate pricing to ensure stable product prices and export market shares. While there are numerous variations, the intention of each follows closely Sweezy's theory of the 'kinked' demand curve: not to disturb current market conditions with price changes, thereby maintaining the status quo. Applied

to international markets subject to exchange rate changes, home firms simply absorb the resulting profit (devaluation) or loss (revaluation).

Dunn reaches this conclusion in his study of oligopoly pricing in specific Canadian products.[1] He maintains that the assumptions and constraints of perfect competition and profit maximization have little relevance for actual pricing decisions. He notes that Canadian firms involved in export markets price in each market on the basis of long-run exchange rate expectations.[2] If these expectations change, the firm will change its export and domestic prices accordingly. Thus, firms must accept constantly varying returns, in terms of their home currencies, from their export sales.

Gray states that an oligopolistic market is one of two situations (the other, international marketing agreements, is discussed below) in which the price effects of a devaluation may not be reflected in the prices of exported commodities.[3] If the devaluing country is a major world supplier of a particular commodity, home producer/exporters may face an inelastic foreign industry demand curve (see my previous section on Monopoly Power). The industry

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[1] Robert M. Dunn, Jr., "Flexible Exchange Rates and Oligopoly Pricing: A Study of Canadian Markets," Journal of Political Economy, 78 (1970), 140-151.

[2] Ibid., 141.

[3] Peter H. Gray, "Imperfect Markets and the Effectiveness of Devaluation," Kyklos, 18, no. 3 (1965), 513-514.

prefers to maintain its price in the currency of the export markets and it is able to do so as competition in export markets is generally avoided. Gray cites the example of Scotch whiskey prices after the British devaluation in 1949 as exemplifying this type of industry behavior.

In the Brookings Institution study by Kaplan, Dirlam and Lanzilotti,[1] cases are presented of industries pricing to ensure stable prices in export markets. Steel prices during the period reviewed were set to maintain long-run stability, by avoiding short-run shocks, the U.S. Steel Corporation being the industry price setter. With the exception of specialty steel makers, the American industry followed oligopolistic pricing practices.[2] The pricing of automobiles followed closely Sweezy's theory of the 'kinked' demand curve.[3] The policy of du Pont was to meet competition in markets for established products.[4] The leader in the asbestos industry, the Johns-Manville Corporation, priced to assure stability within the industry in order to avoid price wars.[5] In general, pricing by big business was considered part of the general strategy for achieving a

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[1] A.D.H. Kaplan, Joel B. Dirlam, Robert F. Lanzilotti, Pricing in Big Business: A Case Approach (Brookings Institution, Washington, D.C., 1958).

[2] Ibid., 24.

[3] Ibid., 54.

[4] Ibid., 149.

[5] Ibid., 160.

broadly defined goal.[1] It is notable that each of the industries referred to in the Brookings study involves a prominent Canadian exported commodity.

According to an unpublished thesis by Joan McFarland,[2] Canadian export pricing tends to follow the theory of perfect competition, yet her evidence supports a policy of oligopoly pricing. Canadian steel export prices did not change for years following the 1961 Canadian dollar devaluation because the Canadian, as well as the American, industry was, and still is, an oligopoly. The same conclusion is reached for each of the other industries in her study: whiskey, newsprint, pulp and paper products, agricultural equipment, and major electrical appliances. Only in the cement industry was there effective price competition. The results of Eastman and Stykolt's study of the newsprint industry agree with Miss McFarland's conclusion.[3]

Sweeney, in his article concerning the effects of Mexico's 1948/1949 devaluation on its commodity exports, reported that as Mexican exports were mainly raw materials invoiced in U.S. dollars, the effect of the devaluation was to increase profits for producer/exporters.[4] Export market prices were unaffected by the devaluation

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[1] Ibid., 3.

[2] Joan Murray McFarland, "Linder and Demand-Led Theories of the Pattern of Trade," unpublished Ph.D. dissertation (McGill University, 1971), 56.

[3] Harry C. Eastman and Stefan Stykolt, The Tariff and Competition in Canada (MacMillan of Canada, Toronto, 1967), 272-275.

[4] Timothy D. Sweeney, "The Mexican Balance of Payments, 1947-1950," IMF Staff Papers, 3 (1953-1954), 139.

since Mexican exporters wished to maintain their markets. Diaz-Alejandro makes the same statement regarding Argentina's exports and the results of the post World War II currency devaluations.[1] Artus makes a broader statement regarding the overall exports of Japan, Germany, France, the U.S. and the U.K. He claims that, on a whole " ... in the short-run entrepreneurs keep their prices in line with competition's prices so as to avoid sudden changes in their exports .... This effect is likely to be important mainly for relatively homogeneous products for which a change in relative prices would rapidly lead to a large change in market shares".[2] Industrial pricing is geared so as not to disturb the equilibrium between allocated production for home and export markets. Artus estimates that about 80% of Japanese manufactured exports are invoiced in U.S. dollars and are, price-wise, treated in the above manner, as are 18% of German manufactured exports.[3] The estimated effect is less for French exports and considerably less for American and British exports.

One of the results of maintaining export market prices when faced with exchange rate changes is price discrimination to maintain stable prices. The theoretical consequences of this possibility have been previously discussed in each of the other market structure theories. An example would be as follows: prior to an exchange

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[1] C.F. Alejandro-Diaz, Exchange Rate Devaluation in a Semi-Industrialized Country: The Experience of Argentina, 1955-1961 (MIT Press, 1965), 71.

[2] Jacques R. Artus, "The Behavior of Export Prices of Manufacturers," IMF Staff Papers, 21 (1974), 588.

[3] Ibid., 602.

rate change between the Canadian dollar and the French franc the Canadian export price of product A was $1, or 5 French francs (FF). With a dollar devaluation of 10%, export prices unchanged, the export price of A remains 5 FF; but the franc is now worth $0.222 versus $0.20 prior to the devaluation. Product A now sells in France for the equivalent of $1.10, instead of $1.00, although the French consumer still pays 5 FF. Such a situation can be maintained in the long-run only by controlled and delineated international markets, such as would occur in markets dominated by oligopolistic industries.[1]

Pricing to Avoid Production Disruptions: Inventory and Backlogs

When firms produce more than is demanded at the going market price, traditional theory says that the firm will lower its price to sell its entire output. According to the 'kinked' demand curve theory all other firms in the industry will follow by lowering their prices, frustrating the intentions of the first firm. By changing inventory and backlog levels when production does not equal demand at the current market price firms need not concern themselves

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[1] In a conversation with the president of a medium sized Canadian manufacturer/exporter of textiles, it was learned that, though the company purchases most of its yarn and fabrics from Italian sources, the 1976 devaluation of the lira had no effect on the Canadian firm's costs. In the textile industry worldwide sales are invoiced in U.S. dollars. In order to be assured of long-run supplies of inputs from its Italian sources the Canadian firm does not attempt to find alternative sources that quote prices in liras, or who take the lira's devaluation into account, in the short-run. To his knowledge, such sources do not exist in the textile industry.

with changing their prices. "Thus, inventory and order backlog changes provide both buffers to compensate for production imbalances without price structure tampering, and feedback signals to facilitate the adjustment of future production to demand. Only when the signals point strongly to changed demand conditions is a decision to revise the price structure seriously entertained."[1]

Artus has suggested that firms producing relatively homogeneous products price to avoid production disruptions. Due to the relatively high demand elasticity in the markets involved, these firms invent various pricing methods to overcome the temptation accompanying exchange rate changes. Since, in theory, demand functions are elastic, any price change would cause producer/exporters to switch production from one market to the other, or to expand or contract production in general. As these alternatives are costly, producers leave prices unchanged, to attain their overall corporate pricing objectives.[2] In this manner Artus' theory resolves the dilemma posed in my analyses of perfect and monopolistic competition, where the only long-run solution to a home currency devaluation was for total world production to be based in the home country and, to a home currency revaluation, for total world production to be based in foreign countries.

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[1]Scherer, op. cit., 152.

[2]Artus, op. cit., 588.

Full Cost Pricing

In a questionnaire study of British producers, Hall and Hitch state that:

> ...(T)he most striking feature of the answers was the number of firms which apparently do not aim, in their pricing policy, at what appeared ... to be the maximization of profits by the equation of marginal revenue and marginal cost .... The larger part of the explanation (for this) ... is that they are thinking in altogether different terms; that in pricing they try to apply a rule of thumb that we shall call 'full cost', and that maximum profits, if they result at all from this rule, do so as an accidental by product.[1]

According to the authors, firms calculate full cost to include all costs and normal or desired profits. This, as a unit price, is compared to an acceptable price to consumers. Thus, in reality, price is based on the costs of firms in the industry, including normal profits, and is usually set by the leader in the industry or by mutual, though unspoken, agreement among firms. Demand has little to do with final prices. Profits are once more the difference between market price and costs. Full cost pricing also manages the uncertainties of estimated demand function shapes and elasticities.

Among the most pertinent reasons given for basing prices on full costs were: strong industry tradition that costs should

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[1] R.L. Hall and C.J. Hitch, "Price Theory and Business Behavior," Chapter 3 in Oxford Studies in the Price Mechanism, T. Wilson, P.W.S. Andrews, eds. (Clarendon Press, Oxford, 1951), 123.

equal full cost; firms do not know their demand and marginal revenue curves; fear of a 'kinked' demand curve; belief that industry demand is inelastic (for lower prices) and would attract entrants (with higher prices); and price changes are both costly and disliked by salesmen and consumers alike.[1] In other words, most producers believe that they belong to oligopolistic industries having competitive overtones.

Nordhaus and Godley conclude that, as a result of firms' mark-ups over historical costs being independent of conditions of demand in the factor and product markets, "... the effect of demand on prices over a normal cycle is uncertain but small."[2] Prices fluctuate modestly in industries taken as a whole, to recapture in expansive periods profits lost in slack periods. Kaplan, Dirlam and Lanzilotti state that the American steel industry bases its market prices on standard costs,[3] and according to McFarland the Canadian industry does as well.[4]

None of the studies indicate whether or not full cost pricing includes the effects of an exchange rate change. The evidence from the above and other, previously cited, studies appears to assume that full cost pricing includes the effects of exchange rate

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[1] Ibid., 114-116.

[2] William D. Nordhaus and Wynne Godley, "Pricing in the Trade Cycle," Economic Journal, 82 (September, 1972), 869-872.

[3] Kaplan, Dirlam and Lanzilotti, op. cit., 14-15.

[4] McFarland, op. cit., 106.

changes when the companies involved effectively control the industry in the pertinent export markets. When the companies do not have effective control, exchange rate changes would be absorbed by those sellers affected.

Investment in Sales Organization

One writer has commented that, as a result of their initial and continued investment in sales organization, companies dislike disturbing sales by changing prices. To sell a finished product in an export market, an exporter must first make a generally substantial investment in a sales operation. From this initial base the exporter can expand or contract sales. However, as a result of the long-run nature of such investments companies are reluctant to disturb their export efforts. Only large exchange rate changes could induce them to alter their export prices.[1]

Pricing by International Agreement

By expressed or tacit agreement, firms involved in international trade manage to maintain prices in the face of factors, such as exchange rate changes, that affect only part of the industry. Agricultural products are often sold through government agencies at

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[1]Jacques R. Artus, "The Short-run Effects of Domestic Demand Pressure on British Export Performance," IMF Staff Papers, 17 (July, 1970), 254.

intergovernmental prices.[1] Raw materials, mineral ores and energy resources, for example, are often sold through international consortia such as OPEC. Gray estimates that at least 40% of Canadian export revenue is earned in industries subject to price agreements.[2]

Lately, countries dependent on one or a few individual commodities for the bulk of their foreign exchange earnings have resorted to international agreements to establish base prices for their exports.[3] Although Canada is not a party to these agreements, it exports many of the commodities involved, and, therefore, stands to benefit, both directly as well as indirectly, from the effect of such agreements on the marketing and pricing of such raw materials in export markets (not to mention paying the price for being excluded, as in the case of the adverse effects of the EEC agricultural agreement on Canadian agricultural exports). As such agreements become more and more prevalent, involving a widening

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[1] Avinash Bhagwati and Yusuka Onitsuka, "Export-Import Responses to Devaluation: Experience of the Nonindustrial Countries in the 1960s," IMF Staff Papers, 21 (1974), 423; and H. Vittas, "Effects of Changes in EEC Currency Exchange Rates on Prices, Production and Trade of Agricultural Commodities in the Community," IMF Staff Papers, 19 (July, 1972), 448-449.

[2] Gray, op. cit., 526.

[3] The EEC agricultural agreement is an example of what has been accomplished on a multi-commodity, multi-national level.

selection of exported commodities, export sales will depend less and less on the effects of prices alone (such as they are), and will be able, therefore, to withstand to an even greater extent the direct effect of exchange rate changes.

Conclusion

Pure market structures fail as analytical models in international trade because they are essentially unrealistic and, therefore, empirically unobservable. When faced with home currency exchange rate changes, the theory of perfect competition imposes a solution on individual sellers that requires home producer/exporters to either capture the entire export and home markets (devaluation) or to go out of business altogether (revaluation). Monopoly is quite compatible with the effects of exchange rate changes but as a theory remains an abstraction and empirically non-observable.

Of the imperfect market structures, monopolistic competition proved to be as unrealistic when used to explain the effects of exchange rate changes on home exports as was perfect competition. Only an oligopoly is compatible with changing exchange rates in the long-run. Individual sellers can continue to operate in both their export and home markets after exchange rates change, either absorbing the effects of exchange rate changes in their profit structure or passing them on to the market place, according to the decision-making process of their particular industry where the presence of the individual seller is always taken into account.

Empirically, sellers remain in all markets during currency fluctuations, evidence that, individually, sellers are able to cope with the effects of exchange rate changes. In the following chapter it is demonstrated that the vast majority of industries involved in international trade, both in Canada and in its major trading partners, are oligopolistic. Perhaps the best description of firms and industries involved in export markets has been given by Hall and Hitch:

> It proved to be extremely difficult in practice to distinguish between oligopolistic firms and others. The distinction seems to be almost entirely one of degree, for all firms were conscious to some extent of the presence of competitors and the possibility of reactions to changes in their prices and output policy.[1]

The general outcome of the oligopolistic theories cited above suggests that price changes will not result from exchange rate changes. Under these circumstances it would appear meaningless to propose exchange rate changes in order to affect a country's balance of trade via the price effect on the value of its exports. Statements and projections using such analysis will prove empty of empirical validity.

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[1]Hall and Hitch, op. cit., 123.

CHAPTER 4

CANADIAN COMMODITY EXPORTS FROM 1961 - 1974 AND INDUSTRIAL CONCENTRATION

Introduction

In chapter 3 it was concluded that when international trade is characterized by changing exchange rates, firms produce and sell in all markets only when oligopoly or monopoly characterize the market structure. Since monopoly is not empirically observable, I will concentrate on the degree of oligopolistic power evident in Canadian export industries. The extent of oligopolistic power in Canadian export industries and in the corresponding industries in the countries who are major importers of Canadian exports will determine the degree to which an exchange rate change will affect the value of Canadian exports and Canada's balance of trade. As explained in chapter 3, oligopolistic firms need not change their market prices in order to maximize their profits in the long-run since they can afford to absorb the effects of home currency exchange rate changes. Thus, markets dominated by oligopolies will not be directly affected by exchange rate changes; and the theory relating the export side of the trade balance and price elasticity of demand will be empty of meaning.

I Canadian Exports from 1961-1974

Traditionally, Canadian exports have been highly concentrated both as to commodities and importing countries.[1] Tables 4-1

[1]The levels of concentration indicated in tables 4-2 (commodity) and 4-1 (country) greatly exceed the coefficients of commodity and geographic concentration said to be high according to Albert O. Hirschman (National Power and the Structure of Foreign Trade) and Michael Michaely (Concentration in International Trade), as mentioned in Helen O'Neill, "Ireland's International Trade," (unpublished Master's thesis, McGill University, 1966). Using the Gini coefficients for both countries and commodities, the levels of concentration approximate those indicated in tables 4-1 and 4-2. (The Gini coefficient of geographic concentration is:

$$G_{jx} = 100 \sqrt{\sum_{s} \left(\frac{X_{sj}}{X.j}\right)^2}$$

s = 1 ... m, m equaling the number of trading partners

j = exporting country
s = trading partner
X.j = total value of exports
X_{sj} = value of exports to trading partner s

The Gini coefficient of commodity concentration is:

$$C_{jx} = 100 \sqrt{\sum_{i} \left(\frac{X_{ij}}{X.j}\right)^2}$$

i = 1 ... n, n equaling the number of commodities

Hirschman and Michaely believed that a coefficient above 40 indicated a high level of concentration on both a geographic and commodity basis. Taking the averages from 1961-1974, table 4-1 indicates that Canada's coefficient of geographic concentration approximated 86, using the 18 countries listed. Table 4-5 indicates that Canada's coefficient of commodity concentration, in 1970, approximated 80 for class 2 exports, 93 for class 3, 93 for class 4, and 92 for class 5. My analysis of commodities by export class from 1961-1974 indicates that the composition of exports analyzed in table 4-5 did not vary materially from that of the other years. Thus, using the Gini coefficient as an indication of both commodity and country concentration, Canadian exports can be considered highly concentrated during the years studied.

Table 4-1

Canadian Exports by Country and Region (%)

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1961-1974
W. Europe	26.8	24.8	24.6	24.3	23.9	20.2	18.8	16.9	15.4	18.8	16.6	14.7	14.6	14.9	17.8
U.K.	15.8	14.7	14.8	14.8	13.8	11.2	10.5	9.1	7.6	9.0	7.9	7.0	6.4	6.0	9.0
Belgium/Lux.	1.3	1.1	1.1	1.2	1.5	1.2	.9	1.0	.8	1.2	1.0	1.0	1.1	1.2	1.1
France	1.2	.9	.9	1.0	1.0	.8	.7	.6	.9	.9	.9	.8	.8	1.0	.9
W. Germany	3.3	2.9	2.5	2.6	2.2	1.8	1.6	1.7	1.9	2.3	1.8	1.6	1.8	1.7	2.0
Italy	1.2	1.2	1.1	.8	1.1	1.1	1.3	1.0	.9	1.2	1.2	1.0	1.2	1.5	1.2
Netherlands	1.1	1.2	1.3	1.3	1.5	1.4	1.6	1.3	1.3	1.7	1.3	1.3	1.1	1.2	1.3
Norway	1.2	1.1	1.1	.8	1.0	1.1	.8	.9	.7	1.1	1.1	.8	.7	.7	.9
E. Europe	2.1	.8	3.1	6.0	3.7	4.0	1.6	1.1	.3	1.0	1.1	1.9	1.7	.6	1.7
USSR	.4		2.2	3.9	2.3	3.2	1.2	.7	.1	.6	.7	1.4	1.2	.1	1.1
Middle East	.5	.4	.5	.3	.4	.4	.3	.4	.4	.7	.8	.6	.7	1.0	.6
Africa	1.1	1.1	1.3	1.3	1.3	1.0	1.0	.8	.8	1.1	.9	.8	.7	1.2	1.0
Asia	8.2	7.4	7.9	7.8	6.7	8.0	8.4	7.7	6.8	7.9	7.9	7.8	10.4	10.6	8.5
India	.8	.5	.8	.8	.7	1.1	1.3	.9	.7	.8	.8	.5	.6	.4	.7
Japan	4.0	3.5	4.4	4.1	3.7	3.9	5.2	4.6	4.3	4.9	4.7	4.9	7.3	7.1	5.3
Rep. of China	2.2	2.4	1.5	1.7	1.2	1.8	.8	1.2	.8	.9	1.2	1.3	1.1	1.4	1.3
Oceania	1.9	2.2	2.0	2.2	2.1	1.6	1.8	1.7	1.4	1.5	1.3	1.0	1.1	1.2	1.5
Australia	1.4	1.7	1.5	1.8	1.6	1.2	1.4	1.4	1.1	1.2	1.0	.8	.9	1.0	1.2
S. America	2.5	2.4	2.6	2.2	2.2	2.3	2.1	2.1	2.0	2.2	2.2	2.1	1.8	2.7	2.2
Argentina	.5	.4	.5	.3	.4	.4	.3	.4	.4	.4	.3	.3	.2	.2	.3
Brazil	.5	.5	.4	.3	.2	.2	.2	.4	.3	.5	.5	.4	.5	1.3	.5
Venezuela	.6	.7	.7	.8	.9	.7	.7	.8	.6	.7	.7	.8	.6	.6	.7
C. America	2.8	2.5	2.7	3.1	2.8	2.6	2.2	1.9	2.0	2.3	2.0	1.9	1.8	2.0	2.2
Cuba	.5	.2	.2	.7	.6	.6	.4	.3	.3	.4	.3	.3	.3	.5	.4
Mexico	.7	.7	.8	.8	.6	.5	.4	.4	.5	.6	.4	.5	.5	.6	.5
USA	54.0	58.4	55.4	52.8	56.8	59.9	63.7	67.3	70.8	64.4	67.2	69.0	67.1	65.9	64.5
Total: Above Countries	90.7	92.1	90.2	90.5	91.0	92.1	93.0	93.9	94.0	93.8	93.0	93.7	93.4	92.4	92.9

Source: Compiled from Exports Merchandise Trade, Statistics Canada, various years.

Table 4-2

Exports by Commodities (%)[1]

Commodity Class	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
1. Live animals	1.1	1.1	.6	.4	.9	.8	.4	.4	.4	.4	.4	.4	.6	.3
	1.2	1.1	.6	.4	1.0	.9	.5	.6	.5	.5	.5	.6	.8	.4
2. Food, feed, beverage and tobacco	20.8	19.0	20.9	22.3	19.1	18.7	14.4	11.7	9.7	11.0	11.8	11.5	12.1	11.9
	21.4	19.7	21.7	23.3	20.3	21.1	17.4	14.8	12.9	14.1	15.8	15.8	16.2	16.1
3. Crude materials, inedible	20.8	22.0	21.0	20.0	20.7	19.3	19.0	18.6	17.0	18.8	18.8	18.2	20.2	24.7
	18.7	19.0	18.3	17.5	18.5	18.4	19.0	19.9	19.0	20.8	21.1	20.0	22.0	22.0
4. Fabricated material, inedible	48.2	47.0	45.7	43.3	43.7	39.8	38.0	36.6	35.6	35.8	33.3	33.6	33.0	33.9
	49.7	49.0	47.6	45.2	46.5	44.8	45.8	46.2	47.3	45.8	44.9	45.7	44.3	45.8
5. End products, inedible	8.8	10.6	11.5	13.7	15.2	21.0	28.0	32.3	37.1	33.8	35.6	36.5	33.8	28.9
	8.9	10.9	11.4	13.2	13.4	14.6	17.1	18.1	19.9	18.6	17.5	17.6	16.5	15.4
6. Special transactions	.2	.2	.4	.3	.2	.2	.3	.2	.2	.2	.2	.2	.2	.2
	.2	.2	.4	.3	.3	.3	.2	.4	.3	.2	.2	.3	.2	.3

Note: 1) Under each year the first percentage includes all commodity exports; the second percentage excludes all exports of motor vehicles and parts (since there were offsetting imports) and excludes net exports of crude oil (i.e., net of imports).

Source: Compiled from Exports Merchandise Trade, Statistics Canada, various years.

and 4-2 show the overall degree of such concentration. In particular, Canada has always specialized in exploiting and exporting its natural resources, either in the raw state or in products having a high degree of natural resource content. From 1961 through 1974 this pattern held, although special circumstances tended to bias the overview, as presented in tables 4-1 and 4-2. In later sections of this chapter the discussion centers upon the individual importing countries, and the commodity concentration within each class of exports becomes more apparent.

Exports by Commodity[1]

In table 4-2 Canadian exports are broken down by commodity class.[2] Classes 1 and 6 have never been significant and will not be discussed. Class 2 exports consist primarily of grains (49.8%), whiskey (10.2%), fish (7.6%), meat (4.2%), and tobacco (2.9%). The main reason for the decline in importance of this class during the period was the slow growth of wheat exports relative to the growth of overall exports.

Exports of classes 3 and 4 commodities reflect Canada's specialization in the exploitation and exportation of its other natural resources, forestry products and minerals. The proportion of class 3 exports, crude materials, to total exports actually rose,

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[1]All percentages refer to 1970.

[2]Commodity classes refer to the degree of manufacture. Thus, class 1 refers to live animals (i.e. no manufacturing involved) whereas class 5 refers to completely manufactured products (i.e. end products, inedible).

to almost 25% by 1974.[1] This was due mainly to the growth in the industrialized world's demand for the mineral ores and energy resources that Canada possesses in abundance. According to table 4-7, about fourteen such commodities provided close to 90% of all class 3 exports in 1970 (exports of rapeseed providing a further 4.5%).[2] Fabricated materials (class 4 exports) have always formed Canada's most important export class, but its importance had declined considerably since 1961 when it comprised almost half of total Canadian exports. This has been due to the growing preference on the part of consuming countries to purchase unprocessed ores (class 3 exports) rather than semi-fabricated products of the same metals. Exports of less than a dozen semi-processed minerals and energy products provided slightly more than a third of class 4 exports (35.0%), with forestry products providing almost half (newsprint, 18.9%; woodpulp, 13.3%, lumber, 11.0%; and other wood and paper products, 3.4%; totaling, 46.6%). Other products relying heavily on natural resources content comprised a further 4.7%. Thus, more than 85% of class 4 exports consisted of about eighteen products, related to each other (as well as to 87.6% of class 3 exports) by

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[1] During the period reviewed class 3 exports accounted for between 17% and 22% of total exports. On an adjusted basis class 3 exports accounted for 22% of total exports in 1974, the same proportion as in 1973.

[2] As Canada follows international commodity classification rapeseed is included in crude materials, inedible, whereas it would appear more appropriately classed with other grains in class 2.

Table 4-3

Major Canadian Exports[1]
as % of World Exports

Commodity	Largest World Exporter Country	Largest 4 Exporters[2]	Canada's Rank[3]	% of Total Canadian Exports	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
				re 1970														
Nickel - matte	New Caledonia	97.8	100.0 (3)[4]	2	1.51	7.5	10.0	10.6	5.8	7.6	6.4	4.7	1.1	2.2	2.1	2.6			
Nickel - oxide	Canada	98.0	100.0 (2)	1	.65	97.0	95.2	96.5	99.7	100.0	100.0	99.7	99.2	100.0	98.0	97.5			
Uranium	Canada	100.0	100.0 (1)	1	.16	63.1	42.9	57.7	46.0	51.7	100.0	100.0	100.0	100.0	100.0	100.0			
Nepheline syenite	Canada	100.0	100.0 (1)	1	.04	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0			
Platinum - ore, ingot	Canada	42.6	100.0	1	.17	61.7	60.1	44.3	39.0	41.1	38.6	37.7	40.6	31.9	42.6	21.2			
Iron - tin plate scrap	Canada	67.1	100.0	1	.5	62.5	51.0	45.5	55.7	51.4	56.1	24.1	15.2	22.5	62.1	66.6			
Molybdenum ores	USA	55.5	98.9	2	.37	-	-	-	-	-	-	31.1	32.7	27.6	30.1	27.3			
Selenium	Canada	14.8	96.5	1	.19	45.7	49.4	50.5	49.2	54.3	61.9	73.1	78.4	85.4	74.8	59.3			
Asbestos-unmanufactured	Canada	63.8	96.3	1	1.39	56.4	65.8	67.1	64.2	61.5	62.7	65.6	66.1	65.5	63.8	61.9			
Nickel - unwrought	Canada	59.5	92.1	1	2.55	64.5	62.4	58.8	58.4	60.3	58.8	57.7	55.3	54.8	59.5	53.6			
Gypsum - crude	Canada	59.3	91.8	1	.06	65.9	68.2	65.6	64.1	63.4	62.1	58.9	59.3	51.3	53.3	55.4			
Newsprint	Canada	68.9	91.2	1	6.77	73.4	73.7	72.3	72.3	72.6	72.8	71.3	69.7	70.6	68.9	68.5	67.9	68.2	
Titanium	Canada	48.6	87.0	1	.13	49.4	60.1	43.6	50.7	44.8	44.1	46.9	46.1	45.9	48.6	49.6			
Papeseed	Canada	57.3	86.1	1	.48	63.1	54.6	37.0	21.1	40.2	43.4	48.8	40.2	37.4	57.3	65.9	67.8	72.3	49.2
Silver - ores	Canada	40.1	85.8	1	.21	25.2	23.7	29.7	23.2	30.4	27.9	25.1	30.1	27.0	40.1	50.1			
Nickel - scrap	USA	50.0	85.5	2	.09	1.3	4.2	1.7	1.8	6.4	7.6	7.9	13.4	14.8	16.7	13.0			
Platinum - other	USSR	45.8	84.3	NP	.6	.4	2.8	3.4	.3	2.5	1.8	2.2	1.7	2.3	1.1	1.2			
Sulphur	Canada	93.5	83.5	1	.26	5.0	8.8	14.1	18.2	19.3	21.9	21.6	29.0	26.6	33.5	28.9			
Iron - ferro silicon	Norway	40.3	80.9	3	.7	9.1	13.8	12.8	10.9	10.3	8.6	7.6	7.2	7.1	8.5	9.4			
Woodpulp	Canada	29.9	80.8	1	4.76	26.6	27.1	26.6	26.5	28.0	27.6	28.5	30.1	32.4	29.9	34.5	31.6	31.9	
Copper - ores	Philippines	55.6	80.7	2	1.25	6.2	15.4	13.5	16.6	13.9	15.2	15.5	17.3	16.8	15.0	16.5			
Iron - old & scrap	USA	47.9	79.7	8	.15	5.2	3.6	3.3	4.2	1.6	2.2	2.4	2.7	3.8	3.1	3.4			
Wheat and meslin	USA	34.6	78.9	2	4.15	25.5	21.3	25.0	26.3	23.7	25.9	20.4	19.7	15.7	21.4	24.8	23.5	16.4	17.1
Iron - ferro manganese	France	30.0	78.7	NR	.7	-	-	-	.5	.5	.8	.6	.1	.5	.1	-			
Animal oil	USA	55.6	78.1	4	.13	3.9	3.9	3.8	4.0	4.3	4.6	4.4	4.8	4.4	4.9	5.6	6.1	5.0	5.2
Wheat & flour: Summary	USA	33.6	76.9	2		15.3	11.7	23.4	25.4	22.6	25.0	19.5	18.7	15.1	20.1	23.3	22.5	15.8	16.3
Aluminum - unwrought	Canada	31.2	76.9	1	2.67	44.2	45.2	48.7	44.0	46.4	43.9	37.6	36.8	33.9	31.2	32.6			
Barley	France	29.7	75.9	2	.81	14.3	7.2	7.5	11.4	9.1	11.1	16.4	10.8	9.2	28.5	36.8	32.6	25.8	20.4
Zinc - scrap	Belgium	23.9	75.3	3[8]	.8	11.0	16.2	16.8	16.0	20.3	19.9	21.5	15.2	21.0	18.3	13.8			
Nickel - semimanufactured	UK	27.2	74.9	5	.10	-	-	-	-	-	-	11.7	10.1	7.0	7.8	4.9			
Sawnwood	Canada	35.1	74.7	1	4.14	35.1	34.2	36.1	34.7	35.2	33.9	34.9	35.1	33.5	35.1	38.4	39.9	38.1	
Iron - pig iron	USSR	52.4	73.8	3	.22	10.0	7.5	7.8	8.2	7.1	5.5	4.3	5.5	6.9	6.4	5.8			
Rye	USSR	67.8	73.6	2	.04	6.9	8.4	7.4	22.4	26.1	31.6	26.3	22.8	12.2	23.6	26.3	35.3	9.8	6.5
Paper & board	Canada	34.4	72.7	1	.68	46.0	45.4	43.3	42.2	41.7	41.8	40.1	36.7	35.8	34.4	33.3	32.7	31.6	
Copper - scrap	USA	33.8	72.6	2	.34	6.5	5.7	9.4	7.5	9.3	14.1	15.7	24.7	18.8	16.9	11.2			
Aluminum - scrap	USA	29.6	70.3	2	.10	22.2	23.3	27.6	22.6	30.5	28.6	29.8	28.6	22.7	23.1	25.0			
Lead - scrap	France	41.0	69.2	6	.7	10.2	5.9	10.4	7.8	12.7	8.0	9.8	10.0	8.7	6.6	7.3			
Iron - ingots, bloom	USA	34.3	67.2	NP		6.7	6.4	8.1	7.2	4.6	3.9	3.0	5.0	2.2	1.8	2.9			
Malt	France	23.6	65.2	4	.07	-	-	-	-	-	-	-	-	7.9	8.4	8.6	7.9	7.8	6.9
Flour	USA	23.9	64.5	4	.34	16.2	13.6	13.0	19.1	13.5	17.7	12.9	11.3	10.9	10.7	11.6	12.1	9.4	8.3
Iron -oth. ferro alloys	Norway	22.8	60.6	NP	2.11	.6	2.7	.7	.1	.3	.8	2	.1	.4	.5	[6]			
Aluminum-semimanufactured	USA	15.7	60.5	NR	.10	7.2	6.4	6.2	3.5	4.6	5.3	4.5	3.7	2.0	1.2	1.5			
Oats	Can./USA	15.3	60.2	1	.06	2.4	6.2	32.3	15.7	17.9	15.3	5.0	5.8	6.5	15.3	10.6	9.4	5.1	5.2
Copper - unwrought	Zambia	20.6	59.8	5	2.35	8.5	7.3	7.1	7.0	6.2	6.3	8.2	7.9	6.1	8.0	8.5			
Dry Milk	France	22.2	58.5	5	.18[9]	8.7	4.0	3.8	3.1	5.5	4.2	4.4	4.8	8.8	9.4	7.8	4.7	7.1	3.6
Aluminum - alumina	Jamaica	26.0	57.9	NR		.9	.2	.1	.2	.3	.5	.3	.3	.3	.3	.3			
Lead - ore	Peru	17.5	57.9	2	.25	10.7	8.5	7.0	11.0	13.6	13.1	14.9	15.8	14.9	15.8	19.6			
Lead - unwrought	Australia	26.8	57.8	3	.26	12.0	12.4	10.3	10.4	13.0	11.8	10.7	11.1	8.6	11.1	10.3			
Zinc - ore	Canada	28.7	57.8	1	.76	9.5	12.2	11.1	19.2	22.0	25.4	31.4	31.2	27.4	28.7	31.5			
Fertilizers-manufactured	Canada	16.4	56.3	1	1.29	-	-	8.2	8.6	9.4	10.9	11.3	11.0	12.3	16.4	16.8	12.2	10.5	
Bran milling	Argentina	23.7	56.1	3	.07	1.8	3.6	5.8	8.6	5.9	7.3	4.1	4.8	5.0	7.8	8.1	7.8	6.9	8.6
Zinc - unwrought	Canada	25.1	55.1	1	.54	22.2	21.0	19.6	22.8	23.2	24.5	24.5	23.6	24.2	25.1	21.7			
Copper-semimanufactured	Belgium	16.2	54.1	4	.47	7.9	8.0	9.0	9.6	7.5	9.1	8.6	10.5	7.6	7.7	6.4			
Plywood	Korea	18.3	53.1	4	.24	8.1	10.7	10.1	12.6	11.5	11.9	13.3	11.2	9.5	8.2	6.9	7.5	7.3	
Silver - bullion	Belgium	18.6	52.4	2	.28	7.1	6.5	6.3	4.4	6.8	5.4	6.4	9.2	12.0	11.9	11.5			
Veneer sheets	Philippines	14.7	45.8	2	.11	20.5	22.1	20.0	17.7	18.2	17.5	17.9	14.5	13.0	14.3	13.4	14.1	11.1	
Tobacco-unmanufactured	USA	25.8	45.4	7	.32	2.1	2.7	2.0	2.4	1.9	1.9	2.0	2.2	2.4	2.2	2.3	2.1	2.4	2.5
Iron - ore	Canada	13.0	45.3	1	2.90	10.0	14.2	14.7	15.7	14.8	14.7	15.5	14.8	10.6	13.0	12.6			
Total Canadian exports included					47.29														

Breakdown: Largest 4 exporters -

Above 75%	31
50-74%	24
Below 50%	3
Total number commodities listed	58

Notes:
1) Refers to Export Classes 2, 3, 4 only
2) As % of total world exports
3) Amongst all exporters (NR indicates Canada was not amongst
4) If less than 4 exporters
5) Included in Iron - unwrought alloys
6) Included in Platinum - ores
7) Included in Iron - other ferro alloys
8) Included in Zinc - unwrought
9) Included in Aluminum - scrap

Table 4-4

Index of Industrial Production
(1963=100)

Year	U.K.	Belgium	France	W. Germany	Italy	Netherlands	Norway	Japan	U.S.A.
1960	95	83	87	88	77	87	86	70	87
1962	96	93	95	97	92	95	95	90	95
1963	100	100	100	100	100	100	100	100	100
1964	108	107	107	109	102	110	109	116	106
1965	111	109	109	116	107	116	115	120	115
1966	113	111	116	117	119	123	122	136	126
1967	113	113	119	114	128	129	127	162	127
1968	119	120	124	127	136	143	132	190	133
1969	123	128	138	143	142	159	137	217	140
1970	123	136	147	152	151	175	143	247	135
1971	123	140	153	155	151	186	149	254	135
1972	125	148	165	161	157	194	156	272	145
1973	135	158	177	172	172	207	164	314	159
1974	130	165	181	169	181	212	170	306	157

Sources: U.K.: Central Statistics Office.
France: Institut National de la Statistique et des Etudes Economiques.
W. Germany: Statistiches Bundesamt, Wiesbaden.
Italy: Instituto Centrale di Statistica.
Netherlands: Centraal Bureau Voor de Statistick.
Japan: Bank of Japan.
U.S.A.: Survey of Current Business.
Belgium and Norway: U.N. Statistical Yearbook.

their total reliance on an abundance of mineral and forestry wealth.

It would appear from table 4-2 that exports of finished goods were the outstanding success story behind the growth in Canadian exports during the 1960s and early 1970s. However, a closer look reveals that by excluding motor vehicle exports this increase would have been considerably less. As a result of the Canadian-American Automobile Agreement of the early 1960s, exports of motor vehicles and parts amounted to 13.6% of total Canadian exports and to 64.6% of end products exports in 1970. (By way of comparison, these percentages were .2% and .7% respectively, in 1961.) End products exports as a whole are very specialized. Aside from automotive products they consist mainly of specialized equipment, ships and aircraft (totalling 22.4%). The balance, amounting to 13.0%, is divided among dozens of products, none of which has ever amounted to significant relative proportions.

Exports by Country

While later sections of this chapter analyze exports by country in greater detail, the present section gives an overall impression. Table 4-1 presents a breakdown of Canadian exports by country and/or region of destination from 1961 to 1974. 92.4% of the value of Canadian exports went to eighteen countries in 1974, little changed from 90.7% that was shipped to the same

countries in 1961. The composition within this group, however, became more concentrated during this period. Canada's most important customer, the U.S.A., purchased 54% of all Canadian exports in 1961, versus almost two-thirds (65.9%) in 1974.[1] Other significant changes involved exports to the U.K., whose proportion fell from 15.8% to 6.0%, and those to Japan, whose purchases rose to 7.1% from 4.0% in 1961. Exports to W. Germany also fell, relatively, from 3.3% to 1.7%. Other country changes were negligible.

Exports to the seven industrialized countries of W. Europe included in table 4-1 amounted to 13.3% in 1974 versus 25.1% in 1961, a fall due entirely to the relative declines in the importance of exports to the U.K. and W. Germany. However, if exports to Japan and the U.S. are added to the exports to these seven European countries, fully 86.3% of all Canadian exports were shipped to only nine highly industrialized economies in 1974 (up from 83.1% in 1961), leaving 13.7% as having been shipped to the rest of the world (of which 6.1% was exported to the other nine countries listed).

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[1] The percentages used in this section are gross exports, unadjusted for exports of motor vehicles, crude petroleum and military material (see note 1, table 4-2 and IV below).

II Country Concentration in World Commodity Export Markets

According to value, many of the major commodities exported by Canada enter world markets dominated by four or fewer countries, and in almost every case Canada ranks among the top four exporters. The significance of such a situation is different than that of high industrial concentration within a single economy (discussed below). When countries are themselves monopolists in the exportation of a particular commodity (such as the Canadian Wheat Board as the sole seller of Canadian grains), high seller concentration internationally leads to a strong presumption of oligopoly coupled with monopolistic pricing practices. However, regardless of the high seller concentration by country, such behavior will not necessarily follow since there is no guarantee as to the number of individual producer/exporters within each exporting country.

The importance of high seller concentration by country was outlined in chapter 3.[1] It was pointed out at that time that a unilateral exchange rate change by Canada would have great repercussions on the exportation of commodities in which few selling countries dominated the international markets, since such an exchange rate change would only affect the prices of Canadian producer/exporters. The fewer the number of sellers, the greater

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[1] See Monopoly Power.

the possibility of oligopolistic price behavior.

Table 4-3 lists commodities important in the overall value of Canadian exports. In every case but three, the largest four exporting countries supplied more than half of the world import demand in 1970 (the figure of the remaining three was 45% in each case), and for more than half of the commodities listed the figures for the largest four exporting countries exceeded 75%. Canada ranked as the largest or as the second largest exporter in more than 60% of the examples. In all, 47.2% of Canada's 1970 exports were included in the list. The implication of such high Canadian dominance in world commodity export markets supports the results below, in which Canadian industrial concentration is analyzed: for 47.2% of Canada's exports Canada is among a handful of countries who control world resources.

III Canadian Industrial Concentration Ratios (CRs)

The analysis of the previous section noted that Canada has specialized in the exportation of a relatively small number of commodities to a relatively small number of countries. As a result of the nature of both the commodities exported and the importing countries, the analysis of chapter 3 on the theory of market structures provides insight into the responsiveness of market demand to exchange rate changes in the international value of the Canadian dollar. Chapter 3 concluded that only oligopolistic

or monopolistic sellers could afford to sell in all markets in the face of exchange rate changes. Firms marketing commodities within other types of market structures would, in theory, find it impossible to survive in both the home as well as the export market. As a result, there should be a great tendency for the markets for internationally traded commodities to be highly concentrated (i.e., oligopolistic), dominated by few companies in each industry.

The effect of high industrial (i.e., oligopolistic) concentration on the demand for commodities was also analyzed in chapter 3. It was concluded that the normal buyer behavior, based on the price elasticity of demand for individual products, would be preempted by the oligopolistic behavior of the producer/exporters. No buyer reaction was possible because the effects of the exchange rate changes would be absorbed and adjusted for by the industries as a whole, rather than being left to the individual companies directly affected. Thus, the degree to which the producer/exporters of a country are, in fact, highly concentrated will determine the overall effectiveness of any exchange rate changes on both the value of a country's exports and, therefore, on the balance of trade, as a result of consumer response to theoretical price changes.

The methodology employed below in the calculation of the

degree of industrial concentration in Canadian export industries was adapted from that developed by Bain.[1] Bain suggests that " ... company concentration within an individual industry ... is usually measured ... by the percentages of the total shipments, output, capacity or employment of the industry accounted for by various absolute numbers of the 'largest' firms in the industry".[2] Further, Bain claims that "(t)he extent of the monopoly power is evidently related to the degree of seller concentration as this is revealed by our barebone statistics on percentages of industries controlled by a given absolute small numbers of firms ...."[3]

Employing seller concentration, as a measure of oligopolistic power, is endorsed by Scherer.[4] According to Scherer an analyst must carefully choose his index of aggregate concentration (that is, his measure of how large a share of economic activity the largest firms contribute). For purely pragmatic reasons "one usually uses the variable on which one can obtain the highest quality data, or maximum comparability, relevant to his hypothesis."[5] This normally

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[1] Bain, op. cit.

[2] Ibid., 67.

[3] Ibid., 73.

[4] Scherer, op. cit., 41-52.

[5] Ibid., 41.

eliminates value added due to unavailable comparable data.

> ...By far the most widely used approach is to focus on directly observable dimensions of industry structure. Economic theory suggests that the vigor of competition is related positively to the number of firms in the relevant industry .... An alternative ... is the market concentration ratio, defined as the percentage of total industry sales contributed by the largest few firms .... The most common variant in American studies (referred to as the four-firm sales concentration ratio and often as the concentration ratio) is the percentage of total industry sales made by the leading four firms.[1]

According to Bain, concentration in an industry begins when not more than four firms control at least 25% of the total value of the shipments, progressively becoming more concentrated until the industry is so controlled by a small number of firms that it is considered an oligopoly characterized by monopolistic pricing practices. This point is reached when the largest eight firms control at least 70% of the value of shipments.[2] It is these criteria that I have used in the analysis that follows. Caves also measures seller concentration according to the number and size distribution of firms in a market. According to Caves, highly concentrated industries exist when the largest eight firms control at least 50% of the industry's shipments, and when the largest twenty firms control at least 75%, a dual measure that uses less highly concentrated data than that used in the analysis below.[3] Also, since many sellers

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[1] Ibid., 50.

[2] Bain, op. cit., 72.

[3] Richard Caves (American Industry: Structure, Conduct, Performance), op. cit., 11.

have regional consumer loyalties, Caves believes that any analysis using national concentration figures (the only figures that exist on a wide scale) understates the degree and influence of seller concentration in many industries.

There are economists who do not believe in the value of using seller concentration in predicting seller behavior. Jacoby states that "under contemporary, multi-vectored, dynamic competition, the probability of tacit collusion among a few producers is negligible because the decision variables are so numerous that no producer is able to anticipate the precise actions of his competitors."[1] If this position held true, competition would be effective among a few firms in a concentrated market and concentration ratios would be of minor significance. While his argument is plausible, it is unsupported by tangible evidence in the remainder of his book, whereas the evidence below, gathered from statistics and industry studies involving Canadian exported commodities, supports Bain's hypothesis.

The industrial concentration ratios (CRs) for Canada are those prepared by Statistics Canada for 1970. Tables 4-5 through 4-9 present a breakdown of 1970 Canadian exports by export class according to these CRs. As shown in table 4-5 (which summarizes the findings of the other four tables) almost 60% of all exports analyzed, representing 54.5% of total exports, are included in the

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[1]Neil H. Jacoby, op. cit., 140.

8-firm CR above 70% category, and, therefore, would be considered by Bain's criteria to be marketed by oligopolistic firms characterized by monopolistic pricing practices. As shown below, this percentage is, in fact, considerably higher when the individual export classes are examined in detail. Nevertheless, 54.5% should be considered a rather high percentage, since 10.4% of all exports had no CRs listed and only 4.6% of those industries listed were included in the category considered to be free of industrial concentration (that is, competitive).

Table 4-6 gives the CRs for class 2 exports (food, feed, beverages and tobacco), representing 11% of all Canadian exports in 1970. Although only 16.8% of these exports (20.9% of those analyzed) were considered very highly concentrated (flour, whiskey and unmanufactured tobacco), this figure is deceivingly low because it does not include grain exports (mostly wheat) that accounted for 5.1% of all Canadian exports in 1970. Since grains are marketed through the Canadian Wheat Board, they should be included in the 8-firm CR above 70% column, which would bring its total to 78.5% of class 2 exports analyzed, and to 62.9% of all class 2 exports. Of the remaining class 2 commodities, the meat industry has a high 4-firm CR and a moderately concentrated Herfindahl index.[1] Fish, though somewhat concentrated according to its CR, has a low Herfindahl index and is most probably free of the effects of

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[1] A Herfindhal index above 0.1000 indicates a concentrated industry; see note a, table 4-6 for discussion. According to Scherer, the four-firm and eight-firm concentration ratios and the Herfindahl index have an average correlation coefficient of 0.921. Therefore, each provides very similar results. op. cit., 52.

Table 4-5

Canadian Industrial Concentration
Summary (1970)

Export Class	Total[a] Exports	Total Exports Analyzed	8-Firm[b] CR Above 70%	4-Firm CR[c] Above 75%	4-Firm CR[c] 50-74%	4-Firm CR[c] 25-49%	4-Firm CR[c] Below 25%	No CR Listed
Food, Feed, Beverages & Tobacco								
1970 Exports (mil.$)	1800.3	1441.4	301.8	235.6	142.2	212.6	--	851.0
% of Exports Analyzed	80.1	100.0	20.9	16.4	9.9	14.8	--	59.0
% of Export Class	100.0	80.1	16.8	13.1	7.9	11.8	--	47.3
Crude Materials, inedible								
1970 Exports (mil.$)	3084.0	2870.1	2416.2	2126.3	260.7	53.2	--	429.9
% of Exports Analyzed	93.1	100.0	84.2	74.1	9.1	1.8	--	15.0
% of Export Class	100.0	93.1	78.4	69.0	8.4	1.7	--	13.9
Fabricated Materials, inedible								
1970 Exports (mil.$)	5866.4	5442.5	2440.6	2051.4	537.6	2136.5	645.4	69.6
% of Exports Analyzed	92.8	100.0	44.8	37.7	9.9	39.3	11.9	1.3
% of Export Class	100.0	92.8	41.6	35.0	9.2	36.4	11.0	1.2
End Products, inedible								
1970 Exports (mil.$)	5551.0	5125.7	3686.4	2942.0	857.4	849.4	104.3	372.6
% of Exports Analyzed	92.3	100.0	71.9	57.4	16.7	16.6	2.0	7.3
% of Export Class	100.0	92.3	66.4	53.0	15.5	15.3	1.9	6.7
Total Canadian Exports								
1970 Exports (mil.$)	16301.7	14879.5	8879.7	7392.2	1797.4	3251.7	749.7	1688.5
% of Exports Analyzed	91.3	100.0	59.7	49.7	12.1	21.9	5.0	11.4
% of Export Class	100.0	91.3	54.5	45.4	11.3	20.0	4.6	10.4

Sources: Statistics Canada, Industrial Organization and Concentration in the Manufacturing, Mining and Logging Industries, 1970.

Statistics Canada, data prepared from Export Merchandise Trade, monthly, 1961 to 1974.

Notes: (to Tables 4-5 to 4-9):

a) Refers to the value of 1970 exports.

b) Definition of an 8-firm CR: The value of shipments by the largest eight firms of an industry as a percentage of the total shipments of the industry for the year in question (1970).

c) Definition of a 4-firm CR: The value of shipments by the largest four firms of an industry as a percentage of the total shipments of the industry for the year in question (1970).

Table 4-6

Canadian Industrial Concentration:
Food, Feed, Beverages & Tobacco (1970)

Industry	Total Exports Analyzed	8-Firm CR Above 70%	4-Firm CR				No CR Listed	Herfindahl[a] Index
			Above 75%	50-74%	25-49%	Below 25%		
Meat (mil.$)[b] (CR:%)	76.0			76.0 (53)				0.0577 to 0.1053
Fish	136.9				136.9 (39)			0.0605
Dairy	40.6				40.6 (29)			0.0327
Grains, flour	896.2	66.2 (88)		66.2 (70)			830.0	0.1398
Bran, meal	35.1				35.1 (29)			0.0298
Whiskey	183.1	183.1 (98)	183.1 (86)					0.2938
Tobacco	52.5	52.5 (100)	52.5 (97)					0.2968 to 0.4100
Miscellaneous	21.0						21.0	
Total	1441.4	301.8	235.6	142.2	212.6	--	851.0	
On adjusted basis		1131.8						

Notes: (to Tables 4-6 to 4-9):

a) The Herfindahl Index gives the distribution of shipments, by value, among all enterprises in an industry. A low index indicates that shipments are evenly distributed; a high index indicates greater control of industry shipments by a single enterprise.
Equation: $H = \sum_{i=1}^{n} x_i^2$, where n=number of enterprises in industry
x_i= share of industry's shipments accounted for by the i th enterprise.

b) When applicable the exports of each industry listed are accounted for first by value, in millions of dollars, and then by the industry's concentration ratio, as a percentage.

Table 4-7

Canadian Industrial Concentration:
Crude Materials, Inedible (1970)

Industry	Total Exports Analyzed	8-Firm CR Above 70%	4-Firm CR				No CR Listed	Herfindahl Index
			Above 75%	50-74%	25-49%	Below 25%		
Cattle hides, fur skins	28.8	16.1 (91)	16.1 (78)				12.7	0.1643
Seeds	137.9						137.9	
Pulpwood	23.3				23.3 (37)			0.0589
Iron ore	500.3	500.3 (91)	500.3 (79)					0.2353
Aluminum	16.6	16.6 (95)	16.6 (90)					0.3903
Copper ore	260.7	260.7 (82)		260.7 (68)				0.1553
Lead ore	41.8	41.8 (97)	41.8 (85)					0.2609
Nickel ore	371.6	371.6 (100)	371.6 (100)					0.6600
Platinum, silver ores	61.1	61.1 (97)	61.1 (85)					0.2609
Zinc ore	124.3	124.3 (97)	124.3 (85)					0.2609
Other metal ore	108.7	108.7 (100)	108.7 (93 to 100)					0.3812 to 0.4520
Coal	29.2	29.2 (70)			29.2 (49)			0.0852
Crude Oil	649.1	649.1 (96)	649.1 (79)					0.1940
Natural gas	206.0						206.0	
Asbestos	227.2	227.2 (81+)	227.2 (81)					0.2136
Gypsum, sulphur	82.8	9.5 (89+)	9.5 (89)				73.3	0.2717
Total	2869.4	2416.2	2126.3	260.7	52.5	--	429.9	
On adjusted basis		2760.1						

Table 4-8

Canadian Industrial Concentration:
Fabricated Materials, Inedible (1970)

Industry	Total Exports Analyzed	8-Firm CR Above 70%	4-Firm CR Above 75%	4-Firm CR 50-74%	4-Firm CR 25-49%	4-Firm CR Below 25%	No CR Listed	Herfindahl Index
Lumber	645.4					645.4 (21)		0.0184
Wood, other	89.7	32.6 (73)		89.7 (50-56)				0.0900
Woodpulp	780.9				780.9 (36)			0.0506
Newsprint	1110.4				1110.4 (36)			0.0506
Paper, board	110.9				110.9 (36)			0.0506
Fabrics: natural manmade	35.0						35.0	
Oils: Animal, vegetable[1]	21.8	21.8 (100)	21.8 (97)					0.1910
Inorganic acids	89.0			89.0 (52)				0.0892
Organic acids	52.8				52.8 (36)			0.0615
Fertilizers	211.6	211.6 (87)		211.6 (51)				0.1544
Polyresins, industrial chemicals	104.0	104.0 (79)		104.0 (57)				0.1097
Fuel oil	31.9	31.9 (97)	31.9 (87)					0.3148
Gas, oil, coal	39.0	39.0 (70)			39.0 (49)			0.0852
Iron, steel: shapes	381.0	345.7 (90-92)	345.7 (72-75)	35.3 (51)				0.1019 to 0.2241
Aluminum shapes	453.9	453.9 (95)	453.9 (90)					0.3903
Copper shapes	462.8	462.8 (94)	462.8 (84)					0.2396
Lead shapes	42.1	42.1 (97)	42.1 (79)					0.2434
Nickel shapes	434.1	434.1 (97)	434.1 (79)					0.2434
Silver ingots	45.4	45.4 (97)	45.4 (79)					0.2434
Zinc shapes	87.9	87.9 (97)	87.9 (79)					0.2434
Other non-ferrous metal shapes	6.7				6.7 (45)			0.0702
Hardware, wire, cable	110.3	66.5 (96)	66.5 (83)	8.0 (55)	35.8 (43)			0.0135 to 0.2017
Glass, cement	22.1	22.1 (100)	22.1 (79-98)					0.1566 to 0.3718
Abrasives	39.2	39.2 (98)	39.2 (88)					0.2733
Electricity	34.6						34.6	
Total	5442.2	2440.6	2051.4	537.6	2136.5	645.4	69.6	
On adjusted basis		4477.4						

1. Since Canada follows international commodity classifications, animal and vegetable oils are included together with inedible crude materials whereas it would appear more logical if they were classed with food, feed, beverages and tobacco exports.

Table 4-9

Canadian Industrial Concentration:

End Products, Inedible (1970)

Industry	Total Exports Analyzed	8-Firm CR Above 70%	4-Firm CR				No CR Listed	Herfindahl Index
			Above 75%	50-74%	25-49%	Below 25%		
Boilers, engines compressors	88.1			88.1 (55)				0.0351 to 0.0947
Natural resource equipment	72.9						72.9	
Special industry equipment	104.3					104.3 (7-16)		0.0042 to 0.0129
Agricultural equipment	105.9	105.9 (80)		105.9 (71)				0.1589
Railroad equipment	35.7	35.7 (99)	35.7 (79)					0.1770
Motor vehicles and parts	3583.7	2801.8 (98)	2801.8 (93)		781.9 (46)			0.0604 to 0.2970
Ships, boats	31.0	31.0 (82)		31.0 (62)				0.1240
Aircraft & parts	389.1	389.1 (84)		389.1 (72)				0.1351
Telecommunication & radar	218.4	218.4 (70)		218.4 (56)				0.1407
Lighting, house appliances	57.7			24.9 (56)	16.8 (43)		16.0	0.0838 to 0.1198
Measuring equipment	94.1						94.1	
Wooden household furniture	9.3						9.3	
Computer, office equipment	104.5	104.5 (91)	104.5 (83)					0.3624
Safety, sanitation	4.5						4.5	
Apparel	41.4				41.4 (38)			0.0297
Sport equipment	9.3				9.3 (40)			0.0647
Biological, medicine	17.4						17.4	
Newspapers	27.2						27.2	
Photo. equip., film	15.8						15.8	
Military	60.4						60.4	
Prefab. and construction	55.0						55.0	
Total	5125.7	3686.4	2942.0	857.4	849.4	104.3	372.6	
On adjusted basis		3711.3						

concentration. The bran and meal industry is low on both counts, and the remainder (fresh apples, chocolate, and biscuits) have no available rating.

Production of class 3 exports (crude materials, inedible) is very concentrated, with all but three industries included in the 8-firm CR above 70% group. This should not be unexpected since, with one exception, all commodities included are minerals generally known for their high industrial concentration. Overall, the class concentration is actually more than 78.4% as shown, since CRs for the oil seeds, natural gas and sulphur industries were unknown. It is reasonable to assume that each of these industries would be included in the highest concentration category. Oil seeds are marketed through a handful of grain dealers, and the industrial structure of the natural gas industry is similar to that of crude oil.[1] If these two are added to the 8-firm CR above 70% category, the high oligopolistic proportion in class 3 rises to 96.2% of exports analyzed, or 89.5% of all crude material exports.

The indicated concentration in class 4 industries (fabricated materials, inedible), is not as high as would be imagined due to the exclusion of the woodpulp and newsprint industries

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[1] McFarland, op. cit.

from the highest concentration category. Exports of woodpulp and newsprint accounted for 36.8% of total class 4 exports in 1970, and their omission is an important factor in the overall concentration of this class. According to another study,[1] the CR in the newsprint and the pulp and paper industries is, in fact, very high, and Canadian companies in these industries act in a completely oligopolistic manner. Therefore, it is useful to include both in the highest concentration group, bringing its proportion to 81.6% of class 4 exports analyzed, or 75.7% of total class 4 exports. Of the remaining commodities, lumber is a significant example of a basically competitive industry. Its CR is below 25%, supported by a low Herfindahl index. It is possible that the companies producing inorganic acids are highly concentrated, for the 4-firm CR is 52% and the Herfindahl index is close to 0.1000. Electricity was excluded from being ranked due to lack of information. Although its exportation was modest in 1970, by 1974 exports had grown five-fold. Considering that it is a government-controlled industry, it is reasonable to include it in the highest concentration category, bringing the level of the highest oligopolistic concentration of class 4 commodities to 82.3% of the commodities analyzed, and to 76.3% of overall fabricated materials.

Class 5 industries (end products, inedible) show a very mixed pattern. The CRs for nine groups of commodities and part of

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[1] Robert M. Dunn, Jr., "Flexible Exchange Rates and the Prices of Traded Goods: A Study of Canadian Markets," unpublished Ph.D. dissertation (Stanford University, 1967).

another were not available; however, their export value was inconsequential. Included in the highest concentration group are known oligopolies, such as agricultural and telecommunication manufacturers, the automobile and aircraft industries, and computers. A significant omission is automotive accessories which has a relatively high CR (46%) but a more modest Herfindahl index (0.0604). One would question whether automotive accessories are subject to the market conditions of the motor vehicle industry. The latter is the most important consumer, but the general public is also a large user. Therefore, it is believed best to leave exports of this industry unadjusted. Except for lighting products, the remainder had both insufficiently high CRs and Herfindahl indices. Of the lighting industry, it would appear expedient to include in the highest concentration column at least that part that had a reasonably high CR (56%) and a Herfindahl index (0.1198). Concentration in end products, therefore, should be given as 72.4% of commodities analyzed (instead of 71.9%) and 66.9% of all class 5 exports (rather than 66.4%).

While the overall percentage of oligopolistic industries characterized by monopolistic pricing practices was given in table 4-5 as 59.7% of commodities analyzed (or 54.5% of all Canadian exports), the adjustments discussed above raise this proportion to 81.2% and 74.1%, respectively. Thus, almost three-quarters of the commodities produced for export by Canadian industry in 1970

(the year of the dollar revaluation) came out of an industrial structure that possessed enough control over its respective markets to modify significantly, and perhaps to nullify, the potential price effects of an exchange rate change on both the total volume of exports and on the export side of Canada's balance of trade.

Table 4-10 summarizes the above analyses, on the basis of the proportion of exports belonging to each market structure. Only 11.8% belonged to competitive industries, while three-quarters were marketed by oligopolies characterized by monopolistic pricing practices. If the undetermined and unanalyzed are grouped together with the competitive, the combined total is only a quarter of all Canadian exports. Based on the analysis of individual Canadian commodities, without going into the relevant market structures of Canada's export markets, it appears that Canadian exports are overwhelmingly sold under oligopolistic/monopolistic market conditions, by a margin of three to one. Under these conditions, it is difficult to forsee meaningful results in analyzing the effects of exchange rate changes on Canadian commodity exports and the export side of the Canadian balance of trade by means of price elasticity of demand theory.

IV Exports to the U.S.

Exports to the U.S. have always been crucial to Canada's overall balance of trade. Since 1961, as much as 70.8% of total Canadian exports have been shipped to the U.S., while the average

Table 4-10

Market Structure of Canadian Exports:

Summary

(% of total 1970 exports)

Export Class	Exports Analyzed: Industrial Structure: Competitive	Oligop./Monop.	Undetermined	Exports Not Analyzed
1. Live animals	--	--	--	0.4
2. Food, feed, beverages & tobacco	0.7	7.3	0.7	2.2
3. Crude materials, inedible	0.1	16.3	1.1	1.3
4. Fabricated materials, inedible	2.4	28.9	2.0	2.6
5. End products, inedible	8.6	22.6	--	2.6
6. Special transactions	--	--	--	0.2
Totals	11.8	75.1	3.8	9.3

over the years has amounted to 64.5% (see table 4-1).

The breakdown by class of commodities is of interest since some of almost every commodity exported by Canada is sold in the American markets, and in four of the five export classes these exports represented more than half of the totals. Part B of table 4-11 shows that the most interesting proportional change took place in class 5. This was primarily due to the Canadian-American automobile agreement which, since the middle 1960s, has boosted Canadian exports of motor vehicles, parts and accessories to 24.1% of total Canadian end products exports in 1974 from less than 1% in 1961. This has also increased the relative importance of end products exports to 37.1% of total Canadian exports to the U.S.; without the motor vehicle industry exports, this percentage would have been 17.2%. Similarly, exports of crude oil raised the American proportion of Canadian crude material exports to 64.7% by 1974; excluding these exports, the U.S. share would have been 46.5%.

While more of Canada's exports are going to the U.S., gradually less of America's imports are coming from Canada (13.5% in 1974 versus 21.7% in 1964; see table 4-12). Of the U.S. import commodity groups whose 1974 values exceeded $100 million, Canadian exports having less of the American market in 1974 than in 1964 outnumbered those having more of the American market by almost 50%. The comparison is even more startling during the

Table 4-11

Exports to the U.S.

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
Part A														
% of total Canadian exports to U.S. represented by class:														
1. Live animals	2.0	1.8	1.0	0.7	1.5	1.1	0.5	0.6	0.4	0.5	0.5	0.5	0.7	0.4
2. Food, feed, etc.	9.6	8.5	8.8	8.5	8.5	7.1	6.1	5.5	5.4	5.7	5.1	4.9	5.2	3.9
3. Crude materials	22.4	24.5	23.4	22.9	20.9	18.6	16.7	15.4	13.3	15.4	14.9	14.8	16.4	24.3
4. Fabricated material	56.7	54.5	54.9	52.4	51.3	45.8	39.8	37.6	34.8	34.1	33.5	34.3	34.3	34.1
5. End products	9.1	10.4	11.3	15.0	17.5	27.0	36.7	40.7	45.8	44.0	45.8	45.3	43.2	37.1
6. Special transactions	0.3	0.3	0.5	0.5	0.4	0.3	0.2	0.3	0.3	0.2	0.2	0.3	0.2	0.2
Totals	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Part B														
% of total export class shipped to U.S.:														
1. Live animals	91.3	94.7	91.3	87.3	91.0	88.4	81.5	85.4	84.2	81.0	83.0	77.7	81.4	80.6
2. Food, feed, etc.	24.9	26.1	26.4	20.0	25.1	22.7	26.9	31.5	39.4	33.6	29.4	29.5	28.6	21.4
3. Crude materials	58.1	64.9	61.8	60.6	57.4	57.7	56.2	55.6	55.7	52.7	53.2	56.3	54.4	64.7
4. Fabricated material	63.4	67.7	66.6	63.9	66.6	68.8	66.7	69.0	69.2	61.4	67.5	71.9	69.6	66.2
5. End products	56.1	57.4	54.6	58.0	65.2	76.7	83.4	84.8	87.4	83.8	86.5	86.1	85.8	84.4

Table 4-12

Canadian Exports' Share of US Commodity Imports (%)

Export	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	Principal Supplier
Live Animals	50.3	59.8	55.5	39.7	42.3	35.2	34.6	37.0	36.3	47.3	44.1	Mexico
Food, Feed, Beverages, Tobacco												
Meat	9.6	18.5	12.0	8.2	9.1	8.2	10.7	10.4	8.3	8.1	7.1	Australia
Fish	33.6	34.1	30.1	29.9	29.1	28.6	27.2	25.9	22.2	23.0	18.6	Canada
Barley	75.2	97.5	99.9	84.5	85.6	72.7	99.9	99.9	92.6	96.8	99.9	Canada
Oats	77.2	84.5	89.5	72.3	74.5	80.0	86.5	88.5	95.2	78.6	86.7	Canada
Malt	46.3	44.9	47.5	47.6	43.5	47.4	45.0	42.9	39.5	43.2	50.8	Canada
Animal feeds	32.8	37.8	24.7	19.6	20.1	38.2	43.7	43.5	34.6	59.4	60.9	Canada
Whiskey	33.5	32.7	31.3	32.1	31.1	35.6	32.1	31.7	34.2	35.0	28.4	U.K.
Crude Materials, inedible												
Cattle hides	4.5	6.1	5.3	6.5	7.1	8.5	9.7	6.7	10.3	20.5	16.0	New Zealand
Fur skins	14.2	16.9	13.4	19.1	16.0	14.7	18.8	15.6	16.8	18.3	20.7	Canada
Pulpwood	66.4	66.8	68.3	70.8	57.4	61.0	73.7	69.0	61.3	67.0	75.3	Canada
Iron ore	65.2	59.6	59.1	62.3	67.9	54.6	62.9	59.3	59.6	58.4	49.1	Canada
Aluminum ore	75.6	65.3	69.4	55.8	51.7	61.9	66.2	51.3	68.3	59.5	43.1	Canada
Silver ore	25.0	34.1	25.9	27.5	25.6	42.4	46.4	51.9	49.4	34.8	34.7	Canada
Asbestos	83.0	85.7	84.0	90.1	89.7	92.7	92.9	92.6	95.7	93.9	94.1	Canada
Lumber	91.5	91.4	89.2	90.8	93.2	91.9	91.3	91.9	94.4	93.1	89.4	Canada
Natural gas	91.1	91.7	92.5	93.9	94.9	95.8	96.0	95.8	96.5	84.7	86.6	Canada
Iron scrap	93.4	82.9	71.6	77.6	81.6	83.3	93.6	90.4	85.9	93.0	92.6	Canada
Fabricated Materials, inedible												
Planned wood	51.0	46.0	41.2	38.3	42.2	39.1	34.9	42.1	41.3	41.3	37.6	Canada
Woodpulp	92.3	90.8	90.8	92.3	93.5	96.2	96.2	96.6	96.7	94.8	96.4	Canada
Newsprint	96.2	96.5	96.5	92.3	96.1	96.3	95.8	96.5	96.3	95.6	97.8	Canada
Inorganic acid	38.6	37.3	28.8	25.4	24.9	25.0	23.8	25.6	22.9	23.7	21.2	Austr/Germany
Organic acid	18.6	20.1	13.8	17.2	15.1	13.2	10.9	9.7	7.6	8.3	7.6	Jap/Germany
Fertilizers	61.9	72.8	82.2	81.2	85.1	87.6	87.1	89.2	84.6	78.7	62.7	Canada
Synthetic rubber	5.6	7.4	8.5	8.6	9.4	8.1	8.9	12.0	12.5	8.2	7.7	Canada
Pig iron	30.3	28.4	19.4	29.6	23.4	20.9	23.0	17.7	17.4	15.4	13.3	Canada/France
Steel bars	6.3	4.6	6.7	7.5	7.3	8.3	12.1	6.3	6.9	6.1	5.8	Japan
Steel wire rods	.3	.1	.1	.4	3.6	3.5	5.5	6.6	4.8	5.5	3.6	Japan
Sheet, strip	16.2	8.7	7.8	5.5	6.4	5.6	7.9	6.8	5.8	5.2	4.6	Japan
Alum. ingots	55.6	55.2	55.7	66.2	62.4	73.0	66.9	64.7	62.6	67.9	66.5	Canada
Copper, refined	15.8	14.1	17.2	23.4	20.2	22.9	27.0	35.4	34.7	31.8	21.1	Canada
Nickel anodes	85.4	87.9	90.7	88.1	87.6	83.3	85.4	83.4	75.4	64.2	62.1	Canada
Zinc pigs	57.6	58.3	43.3	38.2	39.9	47.1	45.3	47.1	51.6	54.1	41.1	Canada
Nuts, bolts	9.2	7.7	10.0	12.1	15.2	13.2	13.0	18.7	16.9	16.7	16.4	Japan
Basic hardward	21.9	26.9	30.3	37.8	41.2	37.7	36.7	37.1	33.4	35.9	34.5	Canada
Plywoods	22.3	21.8	19.5	20.3	14.9	11.4	12.4	13.6	13.4	14.2	15.7	Canada
End Products, inedible												
Tools	3.6	4.6	3.6	3.7	3.9	5.9	4.8	12.7	7.9	6.0	4.6	Germany
Boiler/compressor	20.2	26.8	22.2	21.2	29.7	32.6	31.0	32.0	25.9	26.1	26.6	Can/Germany
Log handling	33.0	37.6	37.6	38.7	33.4	33.9	33.5	34.6	29.2	25.9	30.9	Can/Japan
Cultivator,weeder	96.0	94.3	93.4	92.4	85.7	88.5	87.6	90.6	90.7	86.7	84.2	Canada
Tractors	23.5	39.7	31.7	41.9	60.0	52.6	40.6	34.1	36.2	35.9	27 3	Canada
Aircraft engines	43.8	38.9	36.1	29.7	40.8	41.2	43.4	58.5	20.7	16.5	14.2	U.K.
Car tires	14.6	11.1	15.4	17.9	7.7	5.4	12.2	8.8	8.5	14.2	12.6	Fr/Germany
Tel. equip.	38.2	31.6	23.2	26.2	32.1	27.9	26.4	20.9	10.6	9.4	11.4	Japan
Electric.part	12.3	16.1	12.4	13.5	18.6	17.5	17.9	17.6	14.4	12.8	9.3	Japan
Electric.tube	6.1	6.3	5.0	6.7	8.2	5.7	4.2	4.3	4.0	2.7	2.5	Hong Kong
Measur/test.	8.4	11.1	14.0	15.0	11.4	11.2	20.8	15.3	15.5	13.1	12.3	Jap/Germany
Motor veh./pts	3.7	12.4	30.5	48.9	49.1	55.4	49.9	47.2	46.1	42.9	41.0	Canada
Motor access.	37.2	43.9	79.3	72.9	76.8	79.9	76.0	74.4	71.1	69.1	57.7	Canada
Trucks	5.8	69.1	96.1	98.0	98.9	99.2	99.1	93.6	78.8	86.4	93.1	Canada
Aircraft	80.4	48.5	39.8	66.8	72.8	71.1	78.6	66.5	55.4	43.4	45.2	UK/France
Card punch	11.1	7.1	14.8	26.4	12.0	43.4	63.9	73.4	77.2	60.5	46.2	Canada
Furniture	7.3	17.0	29.1	32.2	40.2	46.4	47.4	52.1	44.9	39.8	40.2	Canada
Recreation	3.5	3.1	3.2	3.7	4.0	5.3	5.4	6.3	5.8	5.9	5.4	Japan/Hong Kong

Above Canadian exports to U.S.A. as % of total U.S. imports:

Excluding motor vehicles & parts -
21.7 18.8 18.1 18.3 17.2 17.3 16.6 16.7 16.1 15.3 13.5

Including motor vehicles & parts exports -
22.1 19.6 21.1 24.0 25.0 27.3 25.6 27.2 25.9 24.1 20.6

Above Canadian exports to U.S.A. as % of total Canadian exports to U.S.A
83.2 83.5 84.9 84.4 83.6 84.5 81.7 83.8 83.7 78.7 72.3

Sources: Compiled from OECD, Trade by Commodities, various years;
Statistics Canada, Export Merchandise Trade, various years.

period from 1969 to 1974: overall, thirty-three commodity groups fell while only six increased, seven remaining constant. As a proportion of the value of the imports listed in table 4-12, 81.5% were represented by Canadian exports whose shares of the U.S. markets fell, while only 5.8% were represented by Canadian exports whose share of the U.S. market rose.

It seems apparent that the 1970 Canadian dollar revaluation[1] had a negative effect on most Canadian exports to the U.S. Not only did the American market demand less of each commodity class after 1969 (an overall decline of 6.4 percentage points from 70.8% in 1969 to 64.4% in 1970), but Canadian exports' share of these markets fell for more than 80% of the commodities analyzed. The groups of commodities most affected appear to be in class 5; those least affected, in classes 2 and 3. Without going into the details of individual commodities (which are analyzed in the section that follows), this type of behavior is what price elasticity theorists would expect. However, there does not appear to be a subsequent recovery accompanying the December 1971 devaluation of both the Canadian and American currencies. A glance at the pertinent years in table 4-12 reveals that, with very few exceptions, Canadian exports' share of the American import markets actually fell after 1971 in spite of the theoretical increased costs of competing European and Japanese products in the U.S. market resulting from

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[1]The discussion in this section does not include the possibility that time lags could be involved to account for export changes, as this would involve general equilibrium analysis in which variables other than price could influence exports.

the revaluations of their currencies vis-a-vis both the Canadian and American dollar. This is especially significant for Canada's performance, since the principal suppliers to the American market of those end products and fabricated materials that Canada exports to the U.S. are Japan, West Germany, and France, the very export-minded countries whose exchange rates rose the most during this period.

American Industrial Concentration Ratios

As stated above, exports to the U.S., unlike Canadian exports in general, have shown greater concentration in those industries supplying finished and semi-finished industrial products. Since the middle 1960s this tendency has intensified. The markets for finished and semi-finished products in the U.S. are characterized by higher industrial concentration, as illustrated in table 4-13. Thus, the tendency has been for Canadian exports, shipped to its most important consumer, to be concentrated in products whose domestic industrial CRs have been called by Bain, oligopolistic with monopolistic pricing tendencies.[1] Using Bain's definition in the following analysis, about 64.4% of all class 4 exports to the U.S. and 81.2% of class 5 exports (which together comprised 38.5% of total Canadian exports to all countries in 1970), totalling at least 62.8% of all exports to the U.S. (using 1970 figures) fell into this category.

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[1]Bain, op. cit., 72.

Table 4-13 summarizes exports to the U.S. in 1970 and tables 4-14 through 4-17 contain the details by class of exports. Table 4-13 reveals that very few products met Bain's classification of industries basically free of monopolistic pricing practices (that is, industries with 4-firm CRs below 25%). Only 6.4% of all exports to the U.S. belonged to this category, primarily consisting of semi-processed lumber. Table 4-13 underestimates the degree to which Canadian exports are sold in highly concentrated American markets. As shown in table 4-15, exports of iron ores, crude oil and natural gas, and, as shown in table 4-16, exports of silver ingots and electricity, are omitted from the 8-firm CR above 70% category. There is extensive evidence demonstrating that the American markets for each of these commodities are, in fact, highly concentrated.[1] By including these five products with the other oligopolistic industries having monopolistic pricing tendencies, the proportion of Canadian exports to the U.S. so characterized would rise to 74.7% (from 62.8%). This alone is convincing evidence that the American markets for Canadian exports are, overwhelmingly, oligopolies. As for the Canadian markets which have produced these export commodities, the evidence

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[1] See McFarland, op. cit., Dunn, "Flexible Exchange Rates and Oligopoly Pricing: A Study of Canadian Markets", op. cit.

Table 4-13

U.S. Industrial Concentration:

Summary (1970)

Export Class	Total Exports[a]	Total Exports Analyzed	8-Firm CR Above 70%	4-Firm CR Above 75%	4-Firm CR 50-74%	4-Firm CR 25-49%	4-Firm CR Below 25%	No CR Listed
Food, Feed, Beverages & Tobacco								
1970 Exports (mil.$)[d]	606.0	430.4	210.8	7.3	226.4	177.5	--	19.2
% of Exports Analyzed	70.9	100.0	48.9	1.7	52.5	41.3	--	4.5
% of Export Class	100.0	70.9	34.7	1.2	37.3	29.3	--	3.2
Crude Materials, inedible								
1970 Exports (mil.$)	1625.6	1526.1	271.8	42.2	229.6	1018.6	--	235.7
% of Exports Analyzed	93.9	100.0	17.8	2.8	15.0	66.8	--	15.4
% of Export Class	100.0	93.9	16.7	2.6	14.1	62.7	--	14.5
Fabricated Materials, inedible								
1970 Exports (mil. $)	3606.8	3413.4	2323.5	451.3	1411.6	959.1	510.4	81.0
% of Exports Analyzed	94.6	100.0	68.1	13.2	41.4	28.1	15.0	2.4
% of Export Class	100.0	94.6	64.4	12.5	39.1	26.6	14.1	2.3
End Products, inedible								
1970 Exports (mil. $)	4651.5	4544.0	3778.2	3524.7	264.0	478.3	130.0	147.0
% of Exports Analyzed	97.7	100.0	83.1	77.6	5.8	10.5	2.9	3.2
% of Export Class	100.0	97.7	81.2	75.8	5.7	10.3	2.8	3.1
Total Canadian Exports to U.S.A.								
1970 Exports (mil. $)	10489.9	9913.9	6584.3	4025.5	2131.6	2633.5	540.4	482.9
% of Exports Analyzed	94.5	100.0	66.4	40.6	21.5	26.5	6.5	4.9
% of Export Class	100.0	94.5	62.8	38.4	20.3	25.1	6.1	4.6

Source: U.S. Department of Commerce, Bureau of the Census, Annual Survey of Manufacture - 1971.

U.S. Department of Commerce, Bureau of the Census, Concentration Ratios in Manufacturing Industry - 1963.

Statistics Canada, data prepared from Export Merchandise Trade, monthly, 1961 to 1974.

Notes: for a, b, and c - see Table 4-5.
d Figures refer to values in Canadian dollars.

Table 4-14

US. Industrial Concentration:

Food, Feed, Beverages, Tobacco (1970)

Industry	Total Exports Analyzed	8-Firm CR Above 70%	4-Firm CR Above 75%	50-74%	25-49%	Below 25%	No CR Listed
Meat (mil.$) (CR:%)	69.0			22.9 (50)	46.1 (26)		
Fish	116.7				116.7 (26)		
Grains, flour	15.6				2.2 (39)		13.4
Bran, meal	28.5	16.0 (75)		16.0 (54)	12.5 (38-42)		
Whiskey	176.6	176.6 (73)		176.6 (54)			
Biscuits, chocolate	24.0	18.2 (70-89)	7.3 (77)	10.9 (59)			5.8
	430.4	210.8	7.3	226.4	177.5	-	19.2

Table 4-15

US. Industrial Concentration:

Crude Materials, Inedible (1970)

Industry	Total Exports Analyzed	8-Firm CR Above 70%	4-Firm CR Above 75%	4-Firm CR 50-74%	4-Firm CR 25-49%	4-Firm CR Below 25%	No CR Listed
Cattle hides, fur skins	11.6				11.6 (33)		
Pulpwood	29.7						29.7
Iron ore	323.4				323.4 (27-47)		
Aluminum ore	11.2	11.2 (100)	11.2 (93)				
Copper ore	13.4	13.4 (98)	13.4 (77)				
Lead ore	8.1	8.1 (100)	8.1 (100)				
Nickel ore	68.4	68.4 (80)		68.4 (60)			
Platinum, silver ore	20.6	20.6 (80)		20.6 (60)			
Zinc ore	42.4	42.4 (90)		42.4 (59)			
Other metal ores	26.3	26.3 (80)		26.3 (60)			
Crude oil	649.1				649.1 (33)		
Natural gas	206.0						206.0
Asbestos	71.9	71.9 (75)		71.9 (55)			
Gypsum, sulphur, salt	44.0	9.5 (93)	9.5 (80)		34.5 (37)		
Total	1526.1	271.8	42.2	229.6	1081.6	-	235.7
On adjusted basis		1450.3					

Table 4-16

US Industrial Concentration:

Fabricated Materials, Inedible (1970)

Industry	Total Exports Analyzed	8-Firm CR Above 70%	4-Firm CR Above 75%	4-Firm CR 50-74%	4-Firm CR 25-49%	4-Firm CR Below 25%	No CR Listed
Lumber	450.9					450.9 (11)	
Wood, other	58.4				19.6 (26)	38.8 (16)	
Woodpulp	481.3	481.3 (70+)	42.0 (83)		439.3 (45)		
Newsprint	872.5	872.5 (88)		872.5 (57)			
Paper & board	57.8	43.9 (75)		43.9 (50)	13.9 (27-32)		
Fabrics - natural & manmade	15.5	.2 (87)		.2 (71)	12.1 (30-48)		3.2
Inorganic acids	43.0	43.0 (78)		43.0 (59)			
Organic acids	24.9				24.9 (27)		
Fertilizers	176.0				176.0 (35)		
Industrial Chemicals	48.3	22.6 (82)		22.6 (61)	25.7 (27)		
Fuel oil	30.7				30.7 (45)		
Gas, oil, coal - other	32.4	32.4 (92)	32.4 (82)				
Iron & steel	265.1	247.2 (73-85)	88.6 (70)	137.3 (55-69)	39.2 (27-46)		
Aluminum shapes	166.3	166.3 (94-100)	166.3 (80-100)				
Copper shapes	142.7	104.2 (98)	104.2 (75)		25.0 (41)	13.5 (18)	
Lead shapes	16.4	16.4 (100)	16.4 (90+)				
Nickel shapes	262.3	255.0 (80)		255.0 (60)	7.3 (39)		
Silver ingots	43.4						43.4
Zinc shapes	33.1	33.1 (90)		33.1 (59)			
Non-ferrous metals-other	4.0	4.0 (80)		4.0 (60)			
Hardware, wire, cable	97.1				97.1 (27-45)		
Glass & cement	19.9	1.4 (98)	1.4 (94)		11.3 (49)	7.2 (17)	
Abrasives	37.0				37.0 (48)		
Electricity	34.4						34.0
Total	3413.4	2323.5	451.3	1411.6	959.1	510.4	81.0
On adjusted basis		2401.3					

Table 4-17

US Industrial Concentration:

End Products, Inedible (1970)

Industry	Total Exports Analyzed	8-Firm CR Above 70%	4-Firm CR Above 75%	4-Firm CR 50-74%	4-Firm CR 25-49%	4-Firm CR Below 25%	No CR Listed
Boilers, engines & compressors	54.7	50.2 (73-98)	27.6 (88)	22.6 (54-66)	4.5 (26)		
Natural resource equipment	67.5				67.5 (38)		
Special industry equipment	93.0	4.9 (72)		4.9 (51)	73.4 (28-48)	14.7 (13-23)	
Agricultural equipment	133.8	101.6 (80-95)		112.2 (50-74)	21.6 (44-48)		
Railroad equipment	19.8	19.8 (85)	19.8 (75)				
Motor vehicles & parts	3345.4	3345.4 (81-100)	3345.4 (76-99)				
Ships, boats	28.2				28.2 (42)		
Aircraft & parts	238.6	90.8 (81-89)		90.8 (64-69)	147.8 (25)		
Telecommunication equipment	133.3	48.1 (96-99)	48.1 (94-96)		24.9 (47-49)	46.6 (22)	13.7
Lighting equipment	50.0	17.2 (78-95)	5.5 (91)	11.7 (65)	12.9 (32)	5.1 (19)	14.8
Measuring equipment	70.0	4.8 (77)		4.8 (62)	65.2 (35-38)		
Wooden household furniture	19.5					19.5 (12-18)	
Computer equipment	67.0	67.0 (74-100)	64.6 (75+)	2.4 (63)			
Apparel	28.3					28.3 (5-24)	
Sport equipment	25.1				25.1 (25-28)		
Safety & sanitation equipment	3.4						3.4
Newspapers, etc.	23.0				7.2 (28)	15.8 (16-24)	
Photo equipment & film	13.7	13.7 (99)	13.7 (96)				
Military	48.9						48.9
Prefab. & construction	62.0						62.0
Tires	14.6	14.6 (88)		14.6 (70)			
Hand powered tools	4.2						4.2
Total	**4544.0**	**3778.1**	**3524.7**	**264.0**	**478.3**	**130.0**	**147.0**

previously given reinforces this statement.[1]

Comparison with Canadian CRs

Although the U.S. is not well represented in Canada's class 2 exports the degree of concentration in the individual American industries is remarkably similar to that of the Canadian counterparts. In the case of whiskey, which is the single most important Canadian class 2 export to the U.S., the degree of concentration is very comparable. This similarity continues in the class of crude material exports (see tables 4-13 and 4-15). In both Canada and the U.S., every mineral ore is included in the 8-firm CR above 70% category, with the exception of the American iron ore industry (controlled by the steel companies).

This pattern is followed by exports of fabricated materials. Notably, the woodpulp and newsprint industries (classified as one industry in Canada) are highly concentrated in the U.S. but are not considered to be so in Canada. Considering that, in 1970, almost 80% of Canadian newsprint exports and more than 60% of Canadian woodpulp exports were shipped to the American market, the extent of industrial concentration in Canada would be secondary to that of the American market. Lumber, the most

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[1]There is much evidence of the high degree of American control of Canadian industry, from raw materials to finished products. In many industries, the dominant American firms control their Canadian counterparts. Thus, although there may be industries in which firm concentration would appear lower if the American and Canadian CRs were to be combined, elimination of intra-corporate control would leave the industries as highly concentrated as within the American or Canadian economies alone. Of the four industries examined in chapter 5, whiskey and asbestos are examples of this.

important industry that was not highly concentrated in the American market, was similarly structured in Canada.

Again, there are few dissimilarities within the end products class of exports. Some aircraft and telecommunication equipment exports, produced in highly concentrated Canadian industries, were sold in moderately concentrated (4-firm CR, 25-49%) American markets.

In all, the markets in both countries have remarkably similar industrial CRs. Few exceptions were noted. The degree of industrial concentration in the American markets for goods imported from Canada reinforces the concentration in the corresponding Canadian markets. Thus, for overall Canadian exports, both markets are highly concentrated.

American Imports, U.S. Domestic Shipments, and Canadian Representation

A review of column 2 of table 4-18 shows that, with a few notable exceptions, Canadian exports generally held a subordinate position when analyzed as a proportion of the total of individual U.S. imports in 1970. These percentages remained quite stable both before and after the Canadian dollar revaluation of that year. The figures show even less influence when, in column 3, imports from Canada are compared to U.S. domestic shipments of the same year. Since, individually, Canadian exports to the U.S. are, in general, insignificant when compared to U.S. imports and to the total value

of U.S. domestic shipments, the analysis of Canadian exports should be modified to reflect the somewhat higher industrial concentration ratios of American industry, with the possible exceptions of those products of which Canadian exports hold a dominant position in the U.S. domestic market. The last column in table 4-18 reveals that, with few exceptions, total imports represent a small proportion of total U.S. domestic shipments. With these exceptions in mind it is reasonable to assume that imports in general do not reduce domestic monopoly power.[1]

Table 4-19 summarizes the findings of the above analysis. It shows that 77.4% of Canadian exports to the U.S. in 1970 were commodities from highly concentrated industries that, for the most part, were subject to monopolistic pricing practices. Since exports to the U.S. accounted for 64.4% of total Canadian exports in 1970, and since possibly 77.4% of these exports were sold in highly concentrated markets, at least 50% of all Canadian exports in 1970 most probably were not responsive, in a manner predicted by conventional price elasticity theory, to the dollar revaluation of that year.

Of the remaining exports shipped to the U.S., 13% probably entered competitive market structures. The remainder, 9.6%, were either not analyzed (6.1% of all Canadian exports) or, though

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[1]Bain, op. cit., 73-74.

Table 4-18

Canadian Exports to U.S.

American Imports (1979)

Industry	Canadian Exports (mil.$)	As % of US Imports (%)	Value US Domestic Shipments (mil.US$)	As % of US Domestic Shipments (%)
Class 2 - Food, Feed, Beverages, Tobacco				
Meat	69.0	10.7	18435.0	.4
Fish	116.7	27.2	1331.5	9.8
Grains, flour	15.6	100.0/[b] 86.5/[c] 45.0/[d]	2646.4	.6
Bran, meal	28.5	43.7	5556.7	.5
Whiskey	176.6	32.1	1757.7	10.1
Biscuits	18.2	45.0	1532.7	1.2
Apples, chocolate	5.8	75.7/[e] 22.7/[f]	601.5	1.0
Totals	430.4			
exports analyzed	70.9			
Class 2 exports	23.9			
Class 3 - Crude materials, inedible				
Cattle hides, fur	11.6	9.7/[g] 18.8/[h]	11747.0	.1
Pulpwood	29.7	73.7	NA[i]	
Iron ore	323.4	62.0/[j] 93.6/[k]	3498.4	9.3
Aluminum ore	11.2	66.2	1757.9	.6
Copper ore	13.4	10.6	2909.5	.5
Lead ore	8.1	37.6	521.8	1.5
Nickel ore	68.4	69.4	487.2	14.0
Platinum, silver ore	20.6	46.4		4.2
Zinc ore	42.4	61.7	372.5	11.4
Other metal ores	26.3	8.4	1	5.4
Crude oil	649.1	45.1	22783.3	2.8
Natural gas	206.0	95.9	NA[i]	
Asbestos	71.9	92.9	585.3	12.3
Gypsum, sulphur, salt	44.0	52.2	518.2	8.5
Totals	1526.1			
exports analyzed	93.9			
Class 3 exports	49.5			
Class 4 - Fabricated materials, inedible				
Lumber	450.9	91.3	3967.2	11.4
Wood, other	53.4	12.4[l] 11.9	2360.6	2.5
Woodpulp	483.3	*	960.1	50.1
Newsprint	872.5	85.2	5678.1	15.4
Paper & board	57.8	92.3	6961.5	.8
Fabrics:natural, manufactured	15.5	.4	3254.0	.5
Inorganic acids	43.0	23.2	636.3	6.6
Organic acids	24.9	10.9	n	
Fertilizers	176.0	87.1	1047.5	16.8
Industrial chemicals	48.3	8.9	16347.8	.3
Fuel oil	30.7	2.0	551.0	5.6
Gas, oil, coal: residual	32.4	96.0	119.0	27.2
Iron & steel	265.1	5.6-23.0	29375.5	.9
Aluminum	166.3	66.9	6270.6	2.6
Copper	142.7	96.9	6480.6	2.2
Lead	16.4	96.6	2063.3	.8
Nickel	262.3	85.4	3833.7	6.8
Silver	43.4	73.9	NA[i]	
Zinc	33.1	45.3	1913.9	1.7
Other non-ferrous	4.0	9.1	2029.6	.2
Hardware, wire, cable	97.1	13.0/ 36.7	9246.4	1.7
Glass & cement	19.9	26.4	3567.5	.6
Abrasives	37.0	NA	775.8	4.8
Electricity	34.4	NA	NA	
Totals	3413.4			
Exports analyzed	98.6			
Class 4 exports	58.2			
Class 5 - End products, inedible				
Boilers, engines	54.7	41.0	10133.3	.5
Equipment:				
Natural resource	67.5	33.5	696.4	9.7
Special industry	93.0	4.8	15558.8	.6
Agricultural	133.8	87.6	4332.3	3.1
- Railroad	19.8	26.9	NA	
- Motor vehicles, parts	3345.4	49.9/76.0/56.9/ 99.1[o]	43855.5	7.6
- Ships, boats	28.2	21.5	2682.4	1.0
- Aircraft & parts	238.6	78.6/43.4[p]	20526.5	1.2
Telecommunications	133.3	26.4/4.2[q]	18748.8	.7
Lighting	50.0	17.9	2887.9	1.7
Measuring	70.0	20.8	5095.1	1.4
- House,wood, furniture	19.5	47.4	2684.4	.7
Computer, office	67.0	63.9	6900.7	1.0
Safety, sanitation	3.4	NA	NA	
- Apparel	28.3	35.9	3809.4	.7
Sporting	25.1	5.4	2448.3	1.0
- Newspapers	23.0	38.8	11829.1	.2
Photo & film	13.7	13.4	4413.5	.3
Military	48.9	69.7	NA	
Prefab. & construction	62.0	NA	NA	
- Tires	14.6	12.2	4616.4	.3
Hand powered tools	4.2	7.6	NA	
Totals	4544.0			
exports analyzed	97.7			
Class 5 exports	81.6			

Notes:

a) Barley
b) Oats
c) Malt & biscuits
d) Apples
e) Chocolate
f) Cattle hides
g) Fur skins
h) Not available
i) Iron
j) Steel scrap
k) see nickel
l) Details from R-firm CR, Tables 4-14 to 4-17.
m) Included with industrial chemicals
n) Calculations not possible for Class 5 exports as volume figures are unavailable.
o) Motor vehicles/accessories/engines/trucks
p) Aircraft/engines
q) All but parts/tubes & parts

Table 4-19

Industrial Market Structure of Canadian Exports to U.S. : Summary of Tables 4-13 to 4-18

(% of total exports, 1970)

Export Class	Exports Analyzed: Industrial Structure Competitive	Exports Analyzed: Oligopolistic/ Monopolistic	Exports Analyzed: Undetermined	Exports not Analyzed
1. Live animals	-	-	-	.5
2. Food, feed, beverages, tobacco	.7	2.9	.5	1.7
3. Crude materials, inedible	-	13.6	.9	.9
4. Fabricated materials, inedible	5.0	25.2	2.1	1.8
5. End products, inedible	7.3	35.7	-	1.0
6. Special transactions	-	-	-	.2
	13.0	77.4	3.5	6.1

analyzed, it was not possible to account for a market structure. It is quite conceivable that many of these exports would have been sold in competitive markets, bringing the overall total of exports sold in competitive markets to 22.6% of exports to the U.S., or to 14.5% of all Canadian exports in 1970.

V Exports to the U.K.

Canadian exports to the U.K. have been on a relative decline since the beginning of the 1960s. As shown in table 4-1, in 1961 the U.K. was Canada's most important customer after the U.S.; but this position has slowly eroded throughout the fourteen years reviewed, until in 1974 the U.K. was purchasing only 6% of total Canadian exports (versus 15.8% in 1961). Considering that the U.K. had the least dynamic economy of the nine industrial countries listed in table 4-4, this trend is not surprising. Industrial production in the U.K. rose only 30% between 1963 and 1974, whereas the increase for the other major industrial economies varied from 57% (U.S.A.) to 206% (Japan).

Exports to the U.K. have concentrated in the natural resources, both raw and semi-processed, that make up the bulk of Canadian commodity classes 2, 3, and 4. In 1974 exports from these classes amounted to 91.5% of total exports to the U.K., down from 97.1% in 1961 (see table 4-20, Part A). Exports of cheddar cheese, salmon and tobacco (class 2) have almost exclusively been

shipped to the U.K. Britain has been an important consumer of Canadian nickel and platinum, and after the U.S.A. is Canada's most important purchaser of newsprint, lumber and woodpulp.

Although exports of end products to the U.K. have been relatively insignificant (0.1% of total class 5 exports in 1974), Britain buys more finished goods from Canada than the combined totals Canada has shipped to Japan, W. Germany, France, Italy, Belgium and Norway (based on 1973 exports). Perhaps the explanation for the relative strength of class 5 exports stems from the stagnation in the industrial productivity of Britian's economy. Such stagnation in a highly industrial economy could reduce the relative demand for raw and semi-processed commodities, while at the same time raise the demand for those end products that the economy involved finds difficult to produce. With regard to the U.K., Canada may have found a better customer for finished products at the expense of less processed exports. The question may be asked, is such a situation in Canada's best interests? Considering the inconsistent and undynamic results shown in tables 4-1, 4-4, and 4-20, the answer must be a qualified no, the qualification being that it is better to sell any commodities even in such a situation than to have traditional exports suffer.

U.K. Industrial Concentration

Concentration within the British economy has been characterized by Everly and Little as collusive, with the degree of

Table 4-20

Exports to the U.K.

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
PART A														
% of total Canadian Exports to UK represented by class:														
1 Live animals	(less than 0.05% for all years)													
2 Food, feed, etc.	26.2	29.7	29.6	26.0	25.7	25.5	25.1	22.4	23.6	17.4	20.2	20.3	21.1	20.7
3 Crude materials	22.5	18.9	21.5	19.7	21.8	20.6	21.1	22.8	21.6	21.3	24.1	22.4	19.7	19.1
4 Fabricated material	48.4	47.7	45.4	50.2	48.3	48.8	48.8	48.9	48.4	54.0	46.6	48.1	49.0	51.7
5 End products	2.9	3.4	3.4	4.1	4.1	5.0	5.0	5.8	6.3	7.2	9.0	9.1	10.1	8.5
Totals	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.
PART B														
% of total export class shipped to UK:														
1 Live animals	.3	.2	.1	.1	.1	.1	.1	.6	.1	.1	.3	.8	1.0	.7
2 Food, feed, etc.	19.9	23.1	21.0	17.3	18.6	15.2	18.3	17.4	18.3	14.3	13.6	12.3	11.1	10.4
3 Crude materials	17.1	12.6	15.2	14.6	14.5	11.9	11.7	11.2	9.6	10.2	10.2	8.6	6.2	4.6
4 Fabricated material	15.9	15.0	14.7	17.2	15.2	13.7	13.5	12.2	10.3	13.6	11.1	10.0	9.5	9.2
5 End products	5.2	4.7	4.4	4.4	3.7	2.6	1.9	1.6	1.3	1.9	2.0	1.7	1.9	.1

actual monopoly power exceeding that suggested by British industrial CRs.[1] The authors conclude that "(i)f competition exists ... it will be oligopolistic in form and rarely extend to active price competition".[2] Bain found the political, as well as the economic, climate in Britain to be more favourable to effective collusion than in the U.S.[3] The results of the analysis below confirm Bain's conclusion.

The compilation of the industrial CRs for the U.K. was based on Bain's definition regarding the CRs in the U.S.[4] Since U.K. data were available only at the 5-firm level, the categorization of an industry as oligopolistic having monopolistic pricing practices was redefined to the above 50% level (as contrasted with Bain's 8-firm CR above 70%). At this level of concentration each firm within an industry would control, on average, more of the market than Bain's original test (10% per firm per industry versus 8.75% according to Bain's definition).

The summary of the unadjusted results of the CR compilations is shown in table 4-21. Overall, more than 80% of analyzed 1970 Canadian exports to the U.K. belonged to the highest oligopolistic

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[1]Richard Everly and I.M.D. Little, Concentration in British Industry (Cambridge University Press, 1960), 45.

[2]Ibid., 48.

[3]Bain, op. cit., 80.

[4]See my analysis above.

Table 4-21

U.K. Industrial Concentration:

Summary (1970)

Export Class	Total Exports	Total Exports Analyzed	5-firm CR Above 50%[a]	25-49%	Below 25%	No CR Listed
Food, Feed, Beverages and Tobacco						
1970 Exports (mil.$)[b]	257.7	232.7	225.3	-	-	7.4
% of Exports Analyzed		100.0	96.8	-	-	3.2
% of Export Class		90.3	87.4	-	-	2.9
Crude Materials, inedible						
1970 Exports (mil.$)	316.1	282.3	251.7	-	-	30.6
% of Exports Analyzed		100.0	89.2	-	-	10.8
% of Export Class		89.3	79.6	-	-	9.7
Fabricated Materials, inedible						
1970 Exports (mil.$)	799.7	745.1	526.2	11.4	6.8	200.7
% of Exports Analyzed		100.0	70.7	1.5	.9	26.9
% of Export Class		93.2	65.9	1.4	.8	25.1
End Products, inedible						
1970 Exports (mil.$)	106.9	66.7	61.2	3.7	-	1.8
% of Exports Analyzed		100.0	91.8	5.5	-	2.7
% of Export Class		62.4	57.3	3.5	-	1.6
Total Canadian Exports to U.K.						
1970 Exports (mil.$)	1481.0	1326.8	1064.4	15.1	6.8	240.5
% of Exports Analyzed		100.0	80.3	1.1	.5	18.1
% of Total Exports		89.6	71.9	1.0	.5	16.2

Source: Compiled using:
U.K. Board of Trade, Report on the Census of Production 1963.

Statistics Canada, Export Merchandise Trade, monthly, 1961-1974.

Notes: a) Value of domestic shipments of largest five firms in industry as percentage of total domestic shipments for 1963.

b) Figures refer to values in Canadian dollars, for 1970. Tables 4-22 to 4-26 refer to 1970 Canadian exports as well.

Table 4-22

U.K. Industrial Concentration:

Food, Feed, Beverages, Tobacco (1970)

Industry	Total Exports Analyzed	5-firm CR above 50%	25-49%	Below 25%	No CR Listed
Meat	5.6				5.6
Fish	8.9	8.9[a] (92)			
Cheese	10.2	10.2 (79)			
Grains, flour	122.6	122.6 (79)			
Animal feeds	20.2	20.2 (59)			
Tobacco	48.8	48.8 (98)			
Potatoes	1.6	1.6 (92)			
Vegetables, not fresh	13.0	13.0 (67-93)			
Apples	1.8				1.8
Total	232.7	225.3			7.4

Note: (applicable to Tables 4-22 to 4-26)

a) The first figure is millions of Canadian dollars (nominal); the figure beneath, in parentheses, is a percentage.

Table 4-23

U.K. Industrial Concentration:

Crude Materials, Inedible (1970)

Industry	Total Exports Analyzed	5-firm CR Above 50%	25-49%	Below 25%	No CR Listed
Furs	3.1	3.1 (50)			
Oil seeds	10.0	10.0 (59-93)			
Iron ore	53.7	53.7 (88)			
Copper ore	1.4	1.4 (74)			
Nickel ore	136.3	136.3 (95)			
Platinum ore	27.1	27.1 (84)[a]			
Zinc ore	3.2	3.2 (69)			
Molybdenum ore	16.0				16.0
Uranium ore	9.0				9.0
Asbestos	16.9	16.9 (82-94)			
Sulphur	2.8				2.8
Other non-metallic minerals	2.8				2.8
Total	282.3	251.7			30.6
On adjusted basis		276.7			

Note: a) CR refers to 1951 Census of Production.

Table 4-24

U.K. Industrial Concentration:

Fabricated Materials, Inedible (1970)

Industry	Total Exports Analyzed	5-firm CR Above 50%	25-49%	Below 25%	No CR Listed
Lumber	61.1				61.1
Wood, other	27.4				27.4
Woodpulp	48.5				48.5
Newsprint	59.6				59.6
Paper & board	39.2	39.2 (56)			
Manmade fabrics	13.3	2.2 (100)	4.3 (36)	6.8 (19)	
Animal & vegetable oil	15.7	15.7 (82-93)			
Inorganic acids	43.8	43.8 (63)			
Organic acids	17.6	17.6 (65)			
Polyresins	13.6	13.6 (99)			
Iron & steel	20.1	13.8 (67-94)	6.3 (45)		
Aluminum shapes	108.3	108.3 (58)			
Copper shapes	161.1	161.1 (74)			
Lead shapes	15.0	15.0 (69)			
Nickel shapes	70.2	70.2 (95)			
Zinc shapes	24.3	24.3 (69)			
Other non-ferrous metals	4.1				4.1
Floor covering material	1.4	1.4 (74)			
Leather, undressed	.8	.8 (45)			
Total	745.1	526.2	11.4	6.8	200.7
On adjusted basis		634.3			

Table 4-25[a]

U.K. Industrial Concentration:
End Products, Inedible (1970)

Industry	Total Exports Analyzed	5-firm CR Above 50%	25-49%	Below 25%	No CR Listed
Boilers, engines	1.1	1.1 (63-84)			
Special industry equipment	.7		.7 (25)		
Motor vehicles & parts	2.8	2.8 (78)			
Ships	1.2	1.2 (68)			
Aircraft & parts	11.0	11.0 (98)			
Telecommunication	19.2	19.2 (64-94)			
Appliances	2.5	2.5 (56)			
Measuring equipment	6.3	3.3 (56)	3.0 (45)		
Computer equipment	9.1	9.1 (62)			
Fur apparel	1.1	1.1 (50)			
Photo film	1.5	1.5 (91)[b]			
Military	8.4	8.4 (62)			
Office machinery	1.8				1.8
Total	66.7	61.2	3.7		1.8

Notes: a) Volume figures for Class 5 exports are either unavailable or, when available, inappropriate for analysis purposes.

b) CR refers to 1951 Census of Production.

Table 4-26

Industrial Market Structures

of Canadian Exports to U.K.

(% of total 1970 exports)

Export Class	Exports Analyzed			Exports not analyzed
	Industrial Structure			
	Competitive	Monopolistic/ Oligopolistic	Undetermined	
1. Live animals	-	-	-	-
2. Food, feed, beverages & tobacco	5.6	15.2	.4	1.7
3. Crude materials, inedible	.2	18.7	1.1	2.3
4. Fabricated materials, inedible	5.3	42.8	3.4	3.7
5. End products, inedible	.2	4.1	.1	2.7
6. Special transactions	-	-	-	-
Total	11.3	80.8	5.0	10.4

category, while only 0.5% belonged to industries basically free of monopolistic practices. Of total exports these figures were 71.9% and 0.5%, respectively. The results of classes 2, 3 and 5 were extreme, since all industries analyzed possessed a high degree of market imperfection. Only in class 4 exports were any industries found to be basically competitive. Few industries were excluded from the 5-firm CR above 50% category, although notable exceptions were molybdenum and uranium ores for which no CRs were listed by the Census of Production. Considering Canada's overall importance in the exportation of both metals and the dominance of the U.S. and Canada in world markets (85.6% and 100%, respectively, in 1970; see table 4-3), these two exports were added to the oligopolistic category in class 3, giving an adjusted class total of 98% of exports analyzed or 85.4% of total crude material exports to the U.K. In general, overall results revealed greater concentration than in both Canada and the U.S.

In class 4 exports adjustments were made for the woodpulp and newsprint industries, raising the percentage of class 4 exports entering highly concentrated British markets from 65.9% of the total to 79.3%. Unfortunately, U.K. CRs were not given for these two industries; however, given the industrial market structures in Canada and the U.S., as well as the combination of the prominence of Canadian exports in the world markets for both products (29.9% and 68.9% in 1970, respectively) and the dominance of the largest exporting countries in world markets (90.8% and 91.2%, respectively),

I decided to include both products in the highest concentration category, on an adjusted basis.

Although no class 5 industries were listed as being completely free of market concentration, Canadian exports to the U.K. were divided among such a large number of different products that less than two-thirds of total exports were analyzed, resulting in the rather low figures reported. However, of those industries analyzed, 90% were considered highly concentrated.

Thus, on an adjusted basis, 80.8% of all 1970 Canadian exports to the U.K. entered an oligopolistic market structure having monopolistic pricing practices. This compares closely with the results of the corresponding commodity market structures in Canada itself (74.1%) and in the U.S. (74.7%).

U.K. Imports: Canadian Representation

Table 4-27 lists the only commodities in which Canadian exports exceeded 25% of total U.K. imports in 1970 and 1971. In each case the commodity involved came out of a highly concentrated Canadian industry and entered an equally concentrated U.K. domestic market structure. With the exception of inorganic acids (for which statistics were unavailable), Canada ranked among the most important world exporters of the commodities included. Together, these ten industries represented 42.9% of all Canadian exports to the U.K. in 1970. A further 35.8% of Canadian exports to the U.K. were products

Table 4-27
Canadian Exports' Shares
of U.K. Import Markets[a] (%)

Commodity	1970	1971
Barley	37.2	30.0
Wheat	33.7	31.3
Iron ore	25.9	30.2
Nickel ores	98.9	45.6
Asbestos	62.7	24.1
Inorganic acids	28.2	26.5
Newsprint	51.9	43.7
Aluminium ingots	44.4	37.5
Nickel, refined	70.3	50.5
Zinc, refined	60.8	42.1

Note: a) Only commodities whose shares exceeded 25% of total imports to the U.K. were included.

Source: Compiled from O.E.C.D., Export Merchandise Trade, Series B, various years.

included in table 4-3, those whose world markets were dominated by four or fewer countries. This lends credence to the previous results that Canadian exports to the U.K. come out of, and enter into, highly concentrated, imperfect market structures.

The evidence given above indicates that, on the basis of industrial concentration ratios, the U.K. domestic markets for the types of commodities Canada exports to Britain are highly concentrated, with more than 80% of the value of Canadian exports entering Bain's classification of oligopolistic market structures having monopolistic pricing practices. All evidence points to a degree of industrial concentration that is higher than in both the U.S. and Canada itself.

VI Exports to Other Countries (tables 4-28 to 4-31)

The analysis of Canada's exports to the remaining sixteen countries (table 4-1) uses the 4-firm and 8-firm concentration ratio statistics employed in determining the degree of such concentration in Canada, in the U.S., and in the U.K. CRs have not been developed for any of the remaining countries, with the exception of Japan (although the latter are unpublished and have not been translated into English). Therefore the results below are only an indication of the degree to which the industrial structures are concentrated, based on the correlation between industrial concentration in Canada, the U.S., the U.K. and in the other sixteen countries.

Table 4-28

Industrial Concentration: Other Countries (1970)

Country	Export Class	Total Exports Analyzed: Cdn $ Value	Total Exports Analyzed: % of Country Total	Analyzed According to: Cdn 8-firm CR Above 70%	Analyzed According to: US 8-firm CR Above 70%	Analyzed According to: UK 5-firm CR Above 50%b	World's 4 Largest 4 Exporters[b]
W. Germany	2	53.6	14.0	13.4	13.4	14.0	13.4
	3	101.3	26.4	22.7	19.9	22.6	20.5
	4	156.4	40.8	38.2	23.0	39.1	11.2
	5	21.6	5.6	4.0	4.2	4.6	NL
	Total	332.9	86.8	78.3	60.5	80.3	75.1
Belgium	2	21.1	11.1	10.6	10.6	11.1	10.6
	3	81.0	42.7	42.7	39.8	42.7	39.8
	4	44.2	23.3	20.7	20.7	20.7	23.3
	5	1.1	.6	.1	.1	.1	NL
	Total	147.4	77.6	74.1	71.2	74.6	73.7
France	2	7.5	4.9	.7	.7	4.8	.7
	3	36.8	23.9	22.1	17.1	22.1	18.8
	4	48.1	31.2	27.2	27.2	27.2	31.2
	5	15.0	9.7	7.8	7.8	9.7	NL
	Total	107.4	69.7	57.8	52.8	63.8	50.7
Italy	1	.8	.4	-	-	-	-
	2	40.6	20.1	20.1	20.1	20.1	20.1
	3	35.8	19.5	19.5	6.6	19.5	6.6
	4	59.4	32.3	29.6	30.1	29.6	31.7
	5	4.7	2.6	1.7	1.7	2.5	NL
	Total	141.3	76.8	70.9	58.5	72.7	58.4
Netherlands	2	32.5	11.7	11.5	11.5	11.5	11.6
	3	94.3	33.9	32.9	18.8	32.5	19.7
	4	57.3	20.6	16.8	14.3	16.8	17.9
	5	54.6	19.6	18.1	18.1	18.5	NL
	Total	238.7	85.7	79.3	62.7	79.3	49.2
Norway	2	6.6	3.7	3.7	3.7	3.7	3.7
	3	151.7	85.2	85.2	85.2	85.2	85.2
	4	4.7	2.6	2.6	2.6	2.6	2.6
	Total	163.0	91.5	91.5	91.5	91.5	91.5
USSR	2	86.6	85.2	85.2	85.2	85.2	85.2
	3	1.2	1.2	1.2	-	-	-
	4	9.5	9.4	9.3	9.0	9.3	9.0
	5	.8	.8	.8	.8	.8	NL
	Total	98.1	96.6	96.5	95.0	95.3	94.2
India	2	44.8	34.5	34.5	34.5	34.5	34.5
	3	14.0	10.8	10.8	10.8	10.8	10.8
	4	50.5	38.9	38.9	29.4	38.9	38.9
	5	4.3	3.3	.7	3.2	3.2	NL
	Total	113.6	87.5	84.9	77.9	87.4	84.2
Japan	2	126.4	15.6	13.1	14.7	15.2	14.7
	3	395.7	48.9	46.8	32.9	46.0	42.7
	4	239.2	29.5	21.4	18.0	21.4	28.4
	5	6.4	.8	.2	.2	.2	NL
	Total	767.7	94.8	81.5	65.8	82.8	85.8
Rep. China	2	121.6	85.6	85.6	85.6	85.6	85.6
	3	2.0	1.4	-	-	-	-
	4	17.3	12.2	12.2	11.9	12.2	12.2
	Total	140.9	99.2	97.8	97.5	97.8	97.8
Australia	3	16.4	8.3	7.5	7.5	8.4	7.5
	4	68.4	34.6	21.9	23.9	24.5	31.8
	5	48.3	24.4	6.7	22.3	22.3	NL
	Total	133.1	67.3	36.1	53.7	55.2	39.3
Argentina	4	29.6	50.1	50.1	50.1	50.1	50.1
	5	17.0	28.8	.9	28.7	28.7	NL
	Total	46.6	78.9	51.0	78.8	78.8	50.1
Brazil	2	18.3	20.9	20.9	20.9	20.9	20.9
	3	3.1	3.6	3.6	3.6	3.6	3.6
	4	26.7	30.6	30.6	30.6	30.6	30.6
	5	21.7	24.9	24.4	24.9	24.9	NL
	Total	69.8	80.0	79.5	80.0	80.0	55.1
Cuba	Total: 2	42.6	72.3	64.4	64.4	64.4	72.4
Mexico	1	2.1	2.3	-	-	-	-
	2	9.7	10.6	-	-	-	10.6
	3	5.4	5.9	5.9	5.9	5.9	5.9
	4	31.6	34.5	20.3	33.9	29.8	28.2
	5	19.2	20.9	4.8	20.9	20.9	NL
	Total	68.0	74.2	30.5	59.7	56.6	44.7
Venezuela	2	3.7	3.3	2.1	2.1	2.1	3.4
	4	14.8	13.3	13.3	11.3	13.3	11.3
	5	69.8	62.7	57.5	62.7	62.7	NL
	Total	88.3	79.3	72.9	76.1	78.1	14.7

Note: a) Figures not available for Class 5 exports (NL = not listed).

b) As % of total country exports (both analyzed and not analyzed).

Table 4-29

Industrial Concentration:

Summary (1970) a,b

Export Class	Analyzed According to: Cdn 8-firm CR Above 70	US 8-firm CR Above 70	UK 5-firm CR Above 50"	World's Largest 4 Exporters
2 Food, feed, beverages and tobacco:				
Canada	1131.8			990.6
US c	210.8	210.8	210.8	210.8
UK d	225.3	225.3	225.3	225.3
W. Germany	51.4	51.4	53.6	51.4
Belgium	20.2	20.2	21.1	20.2
France	1.0	1.0	7.3	1.0
Italy	40.6	40.6	40.6	40.6
Netherlands	32.1	32.1	32.1	32.5
Norway	6.6	6.6	6.6	6.6
USSR	86.6	86.6	86.6	86.6
India	44.8	44.8	44.8	44.8
Japan	105.8	119.1	123.1	119.1
Rep. of China	121.6	121.6	121.6	121.6
Brazil	18.3	18.3	18.3	18.3
Cuba	37.9	37.9	37.9	42.6
Venezuela	2.3	2.3	2.3	3.4
	1005.3	1018.6	1032.0	1024.8
As % of Total Class Exports	71.3	72.3	73.2	72.7
3 Crude materials, inedible:				
Canada	2760.1			1403.9
US c	1450.3	1450.3	1450.3	1450.3
UK d	276.7	276.7	276.7	276.7
W. Germany	87.1	76.4	86.7	78.7
Belgium	81.1	75.6	81.1	75.6
France	34.1	26.4	34.1	29.0
Italy	35.9	12.1	35.9	12.1
Netherlands	91.6	52.3	90.5	54.8
Norway	151.7	151.7	151.7	151.7
USSR	1.2	-	-	-
India	14.0	14.0	14.0	14.0
Japan	379.1	266.5	372.6	345.9
Australia	14.8	14.8	16.6	14.8
Brazil	3.1	3.1	3.1	3.1
Mexico	5.4	5.4	5.4	5.4
	2626.1	2425.3	2618.7	2512.1
As % of Total Class Exports	85.2	78.6	84.9	81.5
4 Fabricated materials, inedible:				
Canada	4477.4			4867.8
US c	2401.3	2401.3	2401.3	2401.3
UK d	634.3	634.3	634.3	634.3
W. Germany	146.6	88.3	150.0	158.1
Belgium	39.3	39.3	39.3	44.2
France	41.9	41.9	41.9	48.1
Italy	54.5	55.4	54.5	58.3
Netherlands	46.8	39.8	46.8	49.8
Norway	4.7	4.7	4.7	4.7
USSR	9.4	9.4	9.1	9.1
India	50.5	38.2	50.5	50.5
Japan	173.4	145.8	173.4	230.1
Rep. China	17.3	16.9	17.3	17.3
Australia	43.3	47.3	48.5	62.9
Argentina	29.6	29.6	29.6	29.6
Brazil	26.7	26.7	26.7	26.7
Mexico	27.3	30.2	27.3	25.9
Venezuela	14.8	12.6	14.8	12.6
	3761.7	3661.7	3770.0	3863.5
As % of Total Class Exports	64.1	62.4	64.3	65.9
5 End products, inedible:				e
Canada	3711.3			
US c	3778.1	3778.1	3778.1	
UK d	61.2	61.2	61.2	
W. Germany	15.3	16.1	17.7	
Belgium	.2	.2	.2	
France	12.0	12.0	15.0	
Italy	3.1	3.1	4.6	
Netherlands	50.4	50.4	51.5	
USSR	.8	.8	.8	
India	.9	4.1	4.1	
Japan	1.6	1.6	1.6	
Australia	13.3	44.1	44.1	
Argentina	.5	16.9	16.9	
Brazil	21.3	21.7	21.7	
Mexico	4.4	19.2	19.2	
Venezuela	64.1	69.8	69.8	
	4027.2	4099.3	4106.5	
As % of Total Class Exports	72.6	73.9	74.0	

Notes: a) The figures in this table refer to the percentages in Table 4-28, as applied to 1970 country exports, by class.

b) All figures are in millions, 1970 Canadian dollars.

c) The figures for the U.S. are based on Tables 4-14 to 4-17, on an adjusted basis. These figures were not reestimated using Canadian and U.K. concentration ratios.

d) The figures for the U.K. are based on Tables 4-22 to 4-25, on an adjusted basis. These figures were not reestimated using Canadian and U.S. concentration ratios.

e) As explained in note (a) to Table 4-28, figures for Class 5 exports are unavailable based on world exports by country.

Table 4-30

Industrial Concentration:

Summary of Table 4-29 (1970)

Export Class		Analyzed According To: Cdn 8-firm CR Above 70%	US 8-firm CR Above 70%	UK 5-firm CR Above 50%
2	Canada	1131.8		
	Others	1005.3	1018.6	1032.0
3	Canada	2760.1		
	Others	2626.1	2425.3	2618.7
4	Canada	4477.4		
	Others	3761.7	3661.7	3770.0
5	Canada	3711.3		
	Others	4027.2	4099.3	4106.5
	Totals:			
	Canada	12080.6		
	Others	11420.3	11204.9	11527.2
	% of Total Exports:			
	Canada	74.1		
	Others	69.6	68.3	70.3

Table 4-31

Industrial Concentration: Various Countries[1]

	U.S.[2]		U.K.[3]	Japan[4]			France[5]			Italy[5]			India[6]		Canada[7]	
Class 2																
Flour, meal	40	52	46	28	53	66	12(3)	19(8)		4(2)		5(8)	5	12(3)	35	
Distilled liquors	64	79	73(6)												84	
Beer, ale	27	41	11	39	98	100(5)	17	25(5)	32(8)						49	
Canned, preserved fruit, vegetables	28	39	21				9	14(5)							32	
Class 3																
Primary aluminium	100	-	43	49	100	-	81	100(2)		61		100(3)	87	100(2)	100(1)	
Primary zinc	53	87	82(5)	32	77	100(5)				25						
Primary lead	-	100		32	77	100(5)				28						
Primary copper	86	NA		23	60	77							100			
Petroleum refining	32	55	93	16	41	84	32	72(3)	100(8)	14	40(3)	66(8)	92(3)	100(4)	79	
										21[G]			34[G]			
Class 4																
Shortening, cooking oils	55	80	79												54	
Steel ingots	64	76	32	23	52	80	16	40(3)	83(8)	38[G]	47(3)		40[G]		81	99(8)
										72(8)			80(2)	100(6)		
Flat glass	90	99	51	58	100	-										
Cement	31	48	89(4)	17	48	82	23	52(3)	73(8)	35	46(2)		42	57(3)	100	
										11[G]			77(8)			
Sulphuric acid	82	95		9	25	58	60			81						
Pulp mills	29	42		13	27	59										
Newsprint													100[G]			
Paper & board	19	31		19	30	64	NA	14(3)	27(8)	17	19(2)		25	56(3)		
													85(8)			
Nitrogen fertilizer													90[G]			
Class 5																
Passenger autos	98	99	74	34	76	100	39	79(3)	100(7)	84	96(3)	100(8)	47	83(2)	100	
										10[G]			95(3)			
Trucks	77	93	86	33	57	93	32	78(3)	100(8)	59	92(3)	100(8)			100	
										9[G]						
Tires & tubes	79	91	73				28	67(3)	75(5)							
Railway cars	64	81	25							20[G]					79	98(5)
Locomotives	91	98	53										100(2)			
													75[G]			
Aircraft	47	96	47				38	62(3)	69(8)	22[G]			100[G]		78	
Shipbuilding	43	58	23	15	31	67	25	57(3)	90(8)	67[G]			100[G]		32	
Farm tractors	73	88					38	76(3)	100(8)	67[G]			100(3)			
													23	50(3)		
Textile machinery	32	46	36										71(5)			
Motors, engines										[illegible][G]						
Electric lamps	93	97	56	37	64	79										
Machine tools	19	29		8	25	58							40	65(2)		
													25[G]			
Telephone, cables													100[G]			

Notes: 1) Compiled from tables included in Joe S. Bain, International Difference in Industrial Structure, op.cit.

2) Data refers to 1954: percentage of value of shipments supplied by the largest four and eight firms.

3) Data refers to 1951: percentage of value added by the largest three firms, with exceptions noted in parentheses.

4) Data refers to 1958: percentage of value of output by the largest one, three and ten firms, with exceptions in parentheses.

5) Data refers to 1959-60: percentage of sales or output by the largest firm, with additional firms noted in parentheses. Government participation noted with [G].

6) Data refers to 1960-61: percentage of output or capacity of largest firm, with additional firms noted in parentheses. Government participation noted with [G].

7) Data refers to 1948: percentage of employment of largest three firms, with additional firms noted in parentheses.

The concentration results for exports to W. Germany exceed those for which CRs were developed. Since exports to Germany follow the pattern already set by those to the U.S. and U.K., it is not surprising that 86.8% were analyzed, with the degree of concentration varying from 80.3% (using U.K. CR statistics) to 60.5% (using U.S. CR statistics).

Exports to Belgium followed the normal Canadian pattern. Industrial concentration would therefore correspond to CRs in the U.S. and U.K. France has become an important purchaser of Canadian end products, although individually each commodity purchased has tended to be relatively immaterial in value. For this reason exports analyzed fell below 70%, as did the degree of concentration. According to Bain, the French government encourages seller concentration through mergers. "In general it would be fair to say that France operates with recognized cartelization and under a policy which encourages increasing seller concentration and does not attempt to reduce existing concentration."[1] This official policy apparently reflects the Italian position too. In Italy it is the government policy to oversee cartels, not to outlaw them. "...The largest two or three firms in Italian industry apparently rather often match the market share of the largest eight firms in the counterpart American industry, so that there is a tendency in Italy toward tighter-knit oligopolies and partial monopolies."[2] As in France,

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[1] Bain, op. cit., 95.

[2] Ibid., 98.

the government is involved in many basic and manufacturing industries, sometimes as the dominant seller (see table 4-31). As regards the other European countries, Canadian exports were largely of natural resources and their derivatives. The market structures, therefore, revealed a consistently high level of industrial concentration.

Exports to the USSR have been concentrated almost exclusively in wheat (85.2% in 1970). There have been indications of other export interest, but considering that the USSR is a completely centralized country, politically and economically, there is little freedom for price considerations to prevail unless the products are free of concentration in Canada itself. As shown in table 4-28, at least 96.5% of Canadian exports to the USSR come out of highly concentrated Canadian industries.

Exports to India do not differ materially from those of the other countries analyzed, with the exception of large exports of fertilizers, the Indian manufacture of which is close to a government monopoly (see table 4-31). It should be noted, however, that seller concentration in India has been encouraged by restrictive governmental policy and by the existence of managing agencies (similar to the zaibatsu in Japan).

Japan has become Canada's second largest export customer, surpassing the U.K. and raising its proportionate share of our exports to 7.1% in 1974, from 4.0% in 1961. However, the Japanese

are major importers of raw materials, and Canadian exports to Japan are no exceptions. Canada sells very little finished commodities to Japan, accounting for less than 3% of total exports to Japan in 1974. (It is significant to note that of total exports to Japan, 85.8% were of commodities considered to be highly concentrated in a global context.) The degree of industrial concentration shown in table 4-28 is most likely understated, considering the structure of the Japanese economy. According to Bain, the zaibatsu, or trading conglomerates,still dominates the Japanese economy. As much as 40% of Japan's big business, from manufacturing and metals to real estate, banking and insurance, is controlled by three reconstituted zaibatsu (Mitsubishi, Mitsui and Sumitomo).[1] "It seems very likely ... that the large volume of vertical supplier-customer transactions and reciprocal trading within each individual zaibatsu substantially reduces the scope and effectiveness of horizontal competition within many Japanese industries, so that more monopoly power is associated with given degrees of intra-industry seller concentration than would otherwise be the case."[2] The data included in table 4-31 reveal relatively high seller concentration, the 10-firm CRs exceeding or close to 60%, of which two-thirds exceed 75%. A study by Caves and Uekusa[3] compared seller concentration in the manufacturing sectors of Japan and the U.S., using

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[1] Ibid., 88.

[2] Ibid., 90.

[3] Richard E. Caves and Masu Uekusa, Industrial Organization in Japan (The Brookings Institution, Washington, D.C., 1976), 16-28.

Japanese concentration figures developed in 1963. The results of their regressions revealed little difference in the degree of seller concentration in the two countries. "Like previous investigators, we find no great difference in concentration between Japan and the United States."[1]

Exports to the Peoples' Republic of China have traditionally been wheat (85.6% in 1970). More recently, exports of nickel anodes and aluminium ingots (9.1% and 2.0% respectively) have become important. However, as with the USSR, China is a completely centralized country and domestic price competition is meaningless.

The Australian economy parallels the Canadian. For this reason, Australian purchases of Canadian exports have not been of traditional raw materials. Exports of end products figure prominently, although for the most part these exports have been individually modest, and, therefore, difficult to analyze, which accounts for the low CRs.

With the exception of Cuba, exports to South and Central American countries have been more heavily concentrated in class 5 (end products) exports than Canadian exports in general. Exports to Brazil have been more traditional, but products of highly concentrated industries. Aside from grain and milk powder, exports to Cuba include small quantities of a variety of finished products

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[1] Ibid., 26.

that, because of their relatively low values and irregularity, defy analysis. On the other hand, exports to Mexico have also included an unusually high proportion of end products, several of which have been of major proportions, as have exports to Venezuela (especially of motor vehicles).

With the exception of Australia and Mexico, Canadian exports to the individual countries discussed above were from highly concentrated industries regardless of the method of analysis used. Occasionally, the overall CRs fell below 70% of total exports for any country. Considering that in only half of the cases exports analyzed exceeded 80% of total exports, these results indicate a level of industrial concentration for overall exports that would exceed the levels indicated in table 4-28.

Conclusion

Tables 4-29 and 4-30 summarize the findings of the above analyses, reviewing exports to Canada's eighteen most important customers. In 1974 exports to these countries accounted for 92.4% of total Canadian exports (little changed from 90.7% in 1961 and the average of 92.9% from 1961-1974). Thus the results are based on an analysis of less than 100% of Canadian exports (actually 93.8%, using 1970 figures). Also, when reviewing the summaries, consideration must be given to the fact that, in each case, considerably less than 100% of exports to any country were analyzed (ranging

from a low of 67.3% of exports to Australia to a high of 99.2% of exports to the Republic of China). With these facts in mind, it was found that Canadian exports come out of, and enter into, highly concentrated industrial structures. Almost three-quarters (74.1%) of the commodities exported by Canada come out of highly concentrated industries. Using Canadian CRs, this figure for all the countries analyzed was 69.6%. Using American CRs, it was found that 68.3% of Canadian exports enter highly concentrated industrial structures; employing U.K. CRs, this figure was found to be 70.3%.

CHAPTER 5

STUDIES OF EXPORT COMMODITIES

Introduction

Chapter 3 analyzed theoretical market structures within a framework of changing exchange rates and international trade. It concluded that only within a monopolistic or oligopolistic structure could individual firms continue to trade in all markets, given the effects of changing exchange rates. As monopoly has not been empirically verified for any widely consumed commodity, oligopoly is left as the sole long-run market structure in which firms are able to operate according to traditional economic theory, both domestically as well as internationally, given a change in exchange rates.

Chapter 4 employed Bain's levels of industrial concentration, as well as the Herfindahl index, in analyzing the degree of seller concentration in Canadian export industries as well as in these same industries in Canada's major trading partners. It was determined that at least 75% of total Canadian commodity exports come out of, and enter into, highly concentrated markets. According to Bain, such firms are able to employ monopolistic pricing practices in order to maximize their profits.

To broaden the scope of this thesis, specific Canadian commodities were analyzed in detail. This chapter examines four Canadian exported commodities. The sole criterion for choosing a

particular commodity was its relative importance to overall exports and to its own particular class of exports. The analysis of each commodity concentrates on its history as an export from 1961 to 1974, the Canadian industry involved and its market structure, and the pricing policies set and followed by the individual firms within the industry.

My conclusion in each case is that the commodity involved is part of an oligopolistic market structure having monopolistic pricing practices. Thus, the theoretical analysis of chapter 3, as well as the industrial market structure hypothesis of chapter 4, are reinforced when specific Canadian exported commodities are studied in greater detail.

I. WHISKEY

Approximately two-thirds of Canadian whiskey production is exported, of which 97% is shipped to the American market. As these figures indicate, the Canadian whiskey industry is export-oriented and completely dependent upon the American market. Exports to other countries are generally restricted as the direct result of outright prohibition or protective tariffs. In spite of this, whiskey exports have risen steadily during the years reviewed. In 1961 the value of whiskey exports represented 1.4% of total Canadian exports and 6.7% of class 2 (food, feed, beverages and tobacco) exports. By 1974 these proportions were 0.6% and 5.2%, respectively.

Canadian whiskey was developed specifically to suit American tastes. Prohibition laws were in effect in the U.S. from 1922 to 1933, placing Canadian distillers in a unique position as the sole legal manufacturers of distilled spirits in North America. This position was exploited when the distillation and sale of whiskey was legalized in the U.S. Canadian producers, using the expertise gained and the inventories built up during the era of American prohibition, moved south, dominating the American market, from production through vertically integrated corporate structures to the distribution and sale of both Canadian and American whiskies.

The Canadian and American Industries

Through astute business dealing, Canadian distillers became the largest American distillers as well, thus assuming the role of vertically integrated multinational corporations dominating, if not controlling, the world market for distilled liquors. The Canadian 4-firm industrial concentration ratio is 86%, and the 8-firm CR, 98%. The American ratios are 54% and 73%, respectively. Both sets of ratios indicate highly concentrated oligopolistic industries having monopolistic pricing practices. The Canadian industry has a higher concentration than the American counterpart, with an Herfindahl index of 0.2938, indicating clear domination of the domestic industry by one firm (the two largest firms produce approximately 70% of the industry's sales). In fact, two

Canadian firms rank one and three in the American industry (the largest being the largest in the world).

Canadian whiskey has made significant inroads into the large American market. In 1961, Canadian whiskey's share of the American market was 6.6%, whereas domestic (American) whiskey's share was 36.4%, bourbon straight, 31.2%, Scotch, 11.0%, and vodka (domestic), 10.0%. By 1973 these relative positions had changed radically: Canadian whiskey had now captured 15.4% of the American market; domestic (American) whiskey had fallen to 20.2% and bourbon straight, to 23.3%, whereas Scotch and domestic vodka had risen to 19.2% and 20.5%, respectively. Clearly, by the end of the period reviewed, competition in the American market was from Scotch and domestic vodka, whereas consumption of both domestic American whiskey and bourbon had declined, both relatively and absolutely (actually, consumption of domestic American whiskey and bourbon fell by 10% during this period).

There are a number of substitutes for Canadian whiskey, the most important being within the same industry (as listed in table 5-1). From the point of view of consumer tastes, Scotch whiskey and vodka have been the main substitutes for Canadian whiskey and have proved to be the most competitive for a larger share of the American market. In spite of the growth of both Scotch and vodka consumption since 1961, consumption of Canadian whiskey has

shown a greater than proportionate rise. This was due entirely to the introduction in the middle 1960s of Canadian whiskey shipped in bulk. A combination of cheaper transportation costs, lower effective tariffs (due to bulk shipments), plus the original grooming of the American taste for imported Canadian whiskey after

TABLE 5-1

Distilled Liquor Consumption
U.S.
(% of total)

Year	Canadian Whiskey	American Whiskey	Bourbons	Scotch	Vodka
1961	6.6	36.4	35.9	11.0	10.0
1964	7.8	32.6	35.0	12.9	11.8
1967	9.5	28.9	33.0	15.0	13.6
1970	12.2	25.6	29.3	17.4	15.5
1973	15.4	20.2	24.7	19.2	20.5

Source: Liquor Handbook, 1974.

prohibition, all contributed to influencing American consumption of the Canadian product during this period. It must be added, however, that the same Canadian distillers who control the American whiskey market are the largest distillers of Scotch whiskey and domestic (American) vodka. Therefore, it is difficult to envision full-scale rivalry between competing spirits. Any competition that exists has been between companies within the industry, on a brand, or advertising basis.

Pricing[1]

As stated above, the multinational corporations who dominate the American industry are fully integrated. Thus, price changes for Canadian whiskey take into consideration the effect such changes will have on the sales of other distilled spirits manufactured and distributed by the same Canadian whiskey distillers. Prices of all competing products tend to change together. This is reflected in table 5-2. The prices given in table 5-2 are composite, based on proportionate consumption figures on a state by state basis. They are only indications of established retail prices, and small fluctuations from year to year are without meaning. Increased state and local taxes accounted for most of the nominal price changes. Only Scotch showed price trends running counter to the others. There are indications that, to a moderate degree, the listed retail price of Scotch changed with the pound/U.S. dollar. The same cannot be said for the price of Canadian whiskey. The 1970 price increase had already come into effect six months before the Canadian dollar revaluation and was part of an industry-wide price increase in the U.S. Subsequent to the revaluation, there were no further price changes in the American retail price of Canadian whiskey.

The industry has definite and strong beliefs that any price

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[1]The information in this section was collected from sources within the industry and from industry publications, mainly the Liquor Handbook.

increase will lead to a decline in sales. Therefore, intra-industry competition is generally kept to advertising campaigns and to states that are neither "control" nor "affirmation" states.[1] Since practically every state is by now either a "control" or "affirmation" state, intra-industry competition has been relegated to advertising campaigns. In their attempts to create differentiated products, firms more than quadrupled their expenditures on all forms of advertising in the decade from 1963 to 1973. New products have been introduced (i.e. the "light" whiskies) and old products have been repackaged (i.e. whiskey shipped in bulk, repackaged as cheaper brands of established whiskies) in order to capture a greater share of a relatively stable market.

Firms within the industry, both in Canada and in the U.S., believe that they are highly interdependent. They realize that unilateral price changes would be neither in their short-run, nor in their long-run, interests, as they face moderately elastic demand within the framework of a Sweezy-type 'kinked' demand curve: price increases would lead to a sharp fall off in sales volume and market shares whereas price decreases would be followed by similar

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[1] Control states are those in which all liquor must be sold through government-controlled outlets. In states with affirmation laws a distiller or importer must affirm that all his prices to wholesalers are no higher than the lowest prices charged in any other state (i.e., in control states, since under the "Des Moines Warranty" distillers have guaranteed control states that they will sell to them at prices no higher than charged elsewhere).

TABLE 5-2

Composite American Retail Prices[1,2]

Year	American (7 Crown) Price	% change	Bourbon (Old Crow) Price	% change	Scotch (Haig) Price	% change	Vodka (Smirnoff) Price	% change	Canadian (V.O.) Price	% change
1961	4.60	-	4.87	-	6.51	-	4.24	-	6.30	-
1962	4.65	1.09	4.84	(2,67)	6.52	.15	4.26	.47	6.37	1.11
1963	4.66	.22	4.84	-	6.51	(.15)	4.29	.70	6.39	.31
1964	4.73	1.50	4.83	(.21)	6.82	4.76	4.49	4.66	6.46	1.10
1965	4.73	-	4.81	(.41)	6.87	.73	4.45	(.89)	6.44	(.31)
1966	4.74	.21	4.81	-	6.99	1.75	4.45	-	6.45	.16
1967	4.78	.84	4.82	.21	7.04	.72	4.50	1.12	6.46	.16
1968	4.90	2.51	4.90	1.66	7.10	.85	4.59	1.02	6.62	2.48
1969	4.90	-	4.97	1.43	6.58	(7.32)	4.70	2.40	6.63	.15
1970	5.19	5.92	5.03	1.21	6.65	1.06	4.83	2.77	6.92	4.37
1971	5.19	-	5.11	1.59	6.67	.30	4.84	.21	6.95	.43
1972	5.21	.39	5.20	1.76	6.81	2.10	4.99	3.10	6.98	.43
1973	5.32	2.11	5.24	.77	7.10	5.58	5.02	.60	7.02	.57
1974	5.34	.38	5.24	-	7.55	5.01	5.04	.40	7.06	.57
1961-1974		16.09		7.60		15.98		18.87		12.06

Notes:

1. Compiled based on proportionate consumption by state (each state having a different average price).
2. When price was not available for specific states, proportionate representation by remaining states was adjusted.
3. Price, in U.S., $, on January basis each year, per fifth.

Source: Compiled using information in the Liquor Handbook, various years.

price changes by other firms in the industry. Therefore, firms change prices in a coordinated manner, thus avoiding price competition.

Unique to the whiskey and tobacco industries is the extremely high incidence of taxes in the retail prices of their products. As much as 60% of the retail price of whiskey is made up of a combination of federal, state and local taxes (indirect taxes). This situation leaves the whiskey industries with less flexibility regarding its price structure. Consumers are confronted with increased prices due to greater indirect taxation as well as rising costs within the industry. Distillers, faced with the possibility of losing sales volume since demand is elastic (especially for price increases), have tried to absorb their rising costs at the risk of falling profits. Retail price changes, therefore, have been due mainly to indirect taxation, some of which has also been absorbed in the cost structure of individual firms.

Firms within the whiskey industry have thus been caught at the 'kink' in their demand curve. Faced with an elastic demand curve to the left of the 'kink', both the firms and the industry have been very reluctant to raise prices, even to cover indirect taxation. Faced with rising costs and a firm belief that sellers are interdependent in an oligopolistic sense, firms cannot afford to lower prices. Only with great hesitation and after finding that their profit margins have been squeezed to their limits have

distillers raised prices to cover part of their increased costs. As seen in table 5-2, such price changes have been infrequent and generally of little consequence.

Since consumer demand for Canadian and American whiskey is confined almost entirely to the North American continent, Canadian distillers do not change their American prices as a result of changes in the U.S. dollar value of the Canadian dollar. Corporate profits are looked at from a total product-line point of view; prices are adjusted for all products at the same time, based on the economics of the fully integrated operations as a whole, with due regard for the effects of exchange rate changes on the overall profitability of the industry's operations. This is clearly an oligopolistic industry in which the Canadian operations are regarded as a small part of a corporate structure that bridges the Canadian-American border. Scotch, as an accepted distilled spirit throughout the world, is somewhat insulated from the effects of exchange rate changes. Distribution can be switched from one country to another, as dictated by the theoretical effects of exchange rate changes on consumer demand. Thus, Scotch distillers can avoid the adverse effects of an exchange rate change on sales volume, or profit margins, in the North American market, whereas Canadian and American distillers do not enjoy such flexibility.

II. RAPESEED

In 1961 Canadian rapeseed exports were not insignificant, being 0.24% of total Canadian exports and 1.15% of class 3 exports. However, by 1974 world demand had boosted the value of rapeseed exports to 0.64% of total Canadian exports, and to 2.57% of class 3 exports, an impressive 15-fold increase (to a large degree understated in the overall figures as a result of the very large increase in Canadian exports of motor vehicles, and understated in the class 3 figures as a result of the unusual increase in Canadian exports of crude oil during the latter part of the period).

The rise in rapeseed exports was the result of two reinforcing events that occurred almost simultaneously: the first was a surge in world demand for animal feed at a time when there appeared to be a growing shortage; the second was the development by Canadian farmers, in 1971, of a new variety of rape low in erucic acid content (LEAR). Within two seasons all Canadian farmers had switched to the new variety, offering animal feeds containing the lowest level of the same toxic acid contained in other varieties of rape as well as in rape substitutes (such as soyabeans). The introduction of LEAR brought to the attention of world seed crushers and animal feed users the fact that high levels of erucic acid were contained in rapeseed, causing them to be wary of using greater quantities in their feed mixtures. This and the easy substitution in planting caused production and exports of rapeseed

to fall after 1973.

Canada is the world's second largest producer of rape, having produced, on average, 14.4% of the world's production from 1961 to 1974 (only India produced more). However, as an exporter, Canada has, during the same period, been unique as the world's leading exporter in that domestic consumption has been a negligible portion of domestic production. In 1973 Canada accounted for 70.7% of world exports, having averaged 53.8% since 1963. Among world producers only France (15.1%) and Sweden (6.8%) have been significant exporters during the same period. Most producers, such as India, require more than they are able to grow and, therefore, are rarely in the position to export.

The Industry Abroad

Canadian rapeseed exports are for the most part shipped to six countries, four of which are members of the EEC: France, W. Germany, Italy and the Netherlands; the remaining two are India and Japan. Together, the six countries purchased 89% of the value of total Canadian rapeseed exports in 1974. The common agricultural policy of the EEC makes it impossible for exchange rate fluctuations to change the internal price of most agricultural products within the common market. When one of the common market currencies fluctuates by more than 2 1/2% from its official parity (which the French franc did in 1969; the German mark and Dutch guilder, in 1969; and which all EEC currencies did, vis-a-vis the

Canadian dollar, in 1970, 1971 and 1973, etc), the country concerned is permitted to impose a border tax on those agricultural imports that compete with domestic production, to offset the currency fluctuation. Thus, Canadian rapeseed can only be imported when demand within the EEC exceeds domestic supplies; and imports cannot be sold at prices that are lower than prices established for domestic production. There cannot be any exchange rate effects on the prices of imports. Therefore, increased rapeseed exports to the EEC countries is dependent upon changes in EEC domestic supplies (that is, French production), and upon the relationship between overall market demand and these supplies.

Similarly, Canadian exports to India are entirely dependent upon the difference between Indian demand and production. As India is the world's largest producer, Canada has been called upon to export rapeseed only when Indian domestic consumption exceeds production, which occurred from 1971 to 1973. When domestic production is capable of meeting demand, India will not permit imports to compete with domestic production, using methods whose effect resembles the EEC border taxes. Therefore, exchange rate changes that could make Canadian rapeseed more competitive are discounted in full by governmental policy.

Japan is the world's largest importer of rapeseed, consuming almost half of the world's exports in 1974 (compared to 20% in 1963). Japan is also Canada's most important customer, buying

over 80% of the total value of Canadian exports in 1974. Exports to Japan have increased constantly throughout the period examined, being 27 times larger in 1974 than they were in 1961. In value, rapeseed exports amounted to 7.2% of total exports to Japan in 1974. Two important factors contributing prominently to the increase after 1971 were the abolition, on May 1, 1971, of rapeseed import quotas, and the Japanese expansion of domestic crushing capacity. By 1972 Japan ranked second in the world as a rapeseed crusher.

There are two main problems regarding Canadian rapeseed exports to Japan: the first is the erucic acid content (discussed above) that affects all rapeseed regardless or origin; the second is the ability and willingness of Canadian farmers to guarantee Japanese rapeseed crushers of a secure source over the long-run. The latter problem is one that haunts every raw material supplier to the Japanese market. The Japanese have even tried to encourage Australia to grow rapeseed, since they have felt that Canadian growers could not be totally relied upon on a long-term basis. Japan worries that high wheat prices will reduce the acreage devoted to rapeseed, a fear that was proven justified in the case of Canadian farmers (Canadian acreage fell 40%, from 5.3 million acres in 1971 to 3.2 million acres in 1974). Since rapeseed is a close substitute for soyabeans in animal feeds, and since Japan is also an important importer of soyabeans, Canada could greatly increase the Japanese demand for rapeseed if it could assure the Japanese of its desire

to supply an expanding market over the long-run. This Canadian farmers have failed to do, with the result that the Japanese continue to look for alternate sources and product substitutes (such as soyabeans) for their domestic requirements.

Substitutes and Pricing[1]

Pricing of rapeseed is, like the pricing of most agricultural raw materials, based on supply and demand and the futures market. As Canada is, by far, the largest exporting country, the Winnipeg Commodity Exchange price is generally regarded as the world price for imported rapeseed. Within the borders of countries that produce rapeseed, such as the EEC countries and India, other prices prevail, generally administered by their respective governments. The Winnipeg price, therefore, is for world demand in excess of domestic supplies.

Table 5-3 gives the average quarterly cash price of rapeseed quoted by the Winnipeg Commodity Exchange, from 1963, when quotations for rapeseed were inaugurated, through the second quarter of 1975. During the period from 1963 until the end of 1972 the cash price for rapeseed fluctuated within a narrow band, from $2.50 per bushel to $3.00, with the exception of 1968 and 1969 when oil seed crushers and animal feed users reduced their purchases of rape as a result of their concern over its erucic acid content.

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[1]The information on pricing came from discussions with representatives of grain dealers based in Winnipeg.

During this period there were several exchange rate changes involving the Canadian dollar and the currencies of nations who purchased Canadian rapeseed. There is no evidence that these currency changes affected either the price of rapeseed or its consumption. This period includes the Canadian dollar revaluation of 1970. An analysis of prices paid, on a country by country basis, during this same period did not reveal any change in unit price or quantity demanded that could be directly connected to any exchange rate change occurring at about the same time or before. Demand appears to have been insensitive to currency changes. It was only after 1972 that the price of rapeseed changed. This coincided with the development, in Canada, of LEAR, and with a reduction in acreage devoted to rapeseed. As stated above, the development of a strain of rapeseed low in erucic acid content influenced many users to substitute rapeseed for other grains in producing animal feed. Since rapeseed competes with other grains (such as barley) for acreage, and since planting is easily switched from one season to the next, production is subject to wide fluctuations that may have little to do with consumer demand. Also, as shown in table 5-4, Canadian requirements for crushing rapeseed into both oil and oil meal increased sixteen-fold between 1961 and 1973, the increases in 1972 and 1973 being 36% and 29% respectively. After 1972 the price of rapeseed rose to such an extent that any dollar devaluation would have been a minor factor in the price to its

TABLE 5-3

Average Quarterly Cash Quotation: Rapeseed

(cents per bushel)

	First	Second	Third	Fourth
1963[1]				280
1964	270	265	261	286
1965	315	288	241	258
1966	283	275	283	274
1967	287	274	256	233
1968	229	212	208	217
1969	237	220	215	277
1970	305	291	264	261
1971	292	289	273	248
1972	236	251	246	271
1973	354	438	623	515
1974	680	683	823	890
1975	664	586		

Note: [1]Quotations of rapeseed prices began on September 16, 1963.

Source: Quarterly Bulletin of Agricultural Statistics (Statistics Canada), various years.

TABLE 5-4

Canadian Consumption and Planting of Rapeseed

	Oilseeds crushed (bushels '000)	Acreage ('000)	Production (bushels '000)
1961	1,181	710	11,220
1962	1,495	371	5,860
1963	1,591	478	8,360
1964	1,749	791	13,230
1965	2,635	1,435	22,600
1966	4,273	1,525	25,800
1967	5,024	1,620	24,700
1968	5,770	1,052	19,400
1969	7,461	2,012	33,400
1970	7,829	4,050	72,200
1971	9,739	5,306	95,000
1972	13,209	3,270	57,300
1973	17,023	3,150	53,200
1974	12,900	3,260	52,900

Source: Quarterly Bulletin of Agricultural Statistics (Statistics Canada), various years.

users. Between the first quarter of 1972 and the last quarter of 1974 the quoted price of rapeseed increased by 277%, whereas during this two year period, the dollar devalued by between 10%-15% vis-a-vis the currencies of Canada's major trading partners (aside from the U.S. which does not import rapeseed). Imports by major consumers, such as Japan, increased substantially in spite of the large increase in price.

Canadian rapeseed is sold by farmers to cooperatives who then sell to Canadian grain dealers. The number of Canadian grain dealers involved in rapeseed exports is, at most, half a dozen. Thus, control over rapeseed marketing is highly concentrated, compounded by the fact that cooperation among the grain dealers is normal.

There are many product substitutes for rapeseed in use, the most notable being soyabeans. There are also substitutes for the land used to grow rapeseed, the most important being wheat and barley. Therefore, it is the relationship between the prices of rapeseed and wheat (and barley) that determines the acreage devoted to growing rapeseed; and it is the relationship between the prices of rapeseed and its substitutes in use (i.e. soyabeans) that determines the market demand for rapeseed. Since the price of wheat has become administered, because of governmental interference, rapeseed supply is dependent upon the prices of substitutes in use (i.e. soyabeans).

Since, as explained above, most of Canada's exports are shipped to countries that are either major producers themselves, purchasing only when their domestic demands exceed domestic supplies, or to countries that are quick to switch from rapeseed to a substitute (and vice versa), relative price differentials lead Canadian grain dealers to react in an oligopolistic manner. Exchange rate changes have little, if any, effect on the international pricing of rapeseed, and, therefore, on the volume of Canadian exports.

III. ASBESTOS

In 1961 the value of asbestos exports represented 2.3% of total Canadian exports and 10.9% of class 3 exports, whereas in 1974 these ratios were 1.1% and 4.3%, respectively. Canadian asbestos is shipped to many countries, but our main customers have been the U.S., Japan and W. Europe. By the 1970s the U.S. was absorbing 33.9% of the value of Canadian exports; Japan, 7.1%; and the nine countries of W. Europe listed in table 4-1, 27.5%. Canada is also the major supplier of asbestos to each of these countries. The ratio of asbestos imports from Canada to total asbestos imports ranged from a high of over 90% in the case of the U.S. to a low of around 40% in the case of Japan. However, such high ratios are to be expected since Canada has consistently supplied more than 60% of the world's demand for asbestos, the USSR and S. Africa being the only other producers/exporters of note. In terms of world producers of high grade ore, Canada is first.

(Much of Russia's production is believed to be filler and not exportable.) Canada exports more than 90% of its own production.

The Canadian Industry

The Canadian industry is primarily situated in Quebec, with only one major company producing outside the province (in British Columbia). The domestic industrial concentration ratio is one of the highest in Canadian industry, being 81.4% at the 4-firm level. Figures are not given at the 8-firm level since it approaches 100% (there are only 10 producing companies in Canada). The Herfindahl index of 0.2136 indicates that one or two firms dominate the industry. This is borne out by industry statistics, which reveal that the Johns-Manville Corporation produces about 35% of total Canadian production.

Not only is the Canadian industry dominated by a few companies but free-world production, fabrication and distribution are controlled by vertically integrated multinational corporations.[1] In Quebec itself, the producers are all members of an association that not only deals with non-business matters on behalf of its members, but also forms the basis for collusion on production, contracts, and industry pricing, in order to avoid intra-industry rivalry and competition.[2] The fact that each producer has an

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[1]Michel Perrault, Notre Amiante (Centrale des Syndicats Democratiques, 1974), 59.

[2]Ibid., 59-60.

equity interest in its "rivals" reinforces the fraternal spirit within the industry.

As stated above, vertically integrated multinational companies control all aspects of the industry, from the ownership of the mines to the utilization of the end products themselves. More than 80% of the asbestos mined is used in the construction industry where the largest asbestos producers are also actively involved. Thus, control of supplies and pricing by a few firms are guaranteed at all levels, throughout the free world.

Product Substitution and Pricing[1]

There are two areas of substitution: in use and in the properties of the product. Since asbestos is a material used almost exclusively in the construction industry there are several other possible usable substitutes, such as wood, aluminium, glass, concrete, etc. However, these products do not possess the same properties as asbestos. In this respect, asbestos is unique. Since, for most uses, it is the properties of asbestos that are required, there is no existing substitute.

There are two price lists for Canadian asbestos: one for the mines in Quebec and the other published by Cassiar Corporation, which operates on the West Coast. In essence, these price lists are identical if product grading and transportation costs are

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[1] Information for this section comes from the following sources: Michel Perrault, Notre Amiante; an industry study prepared by Draper, Dobie & Co.; the Quebec Asbestos Mining Association;and discussions with officers of companies within the industry.

taken into consideration. All companies contract to sell the major part of their production of the coming year in the 4th quarter of the current year. They establish their prices for the entire year at this time. Asbestos is basically a uniform product with many grades, but all production falls into a pre-specified grading classification. Therefore, there is no possible product differentiation within the industry. Generally, the companies give discounts to their largest customers (who are often the parent companies). However, discounting, when it occurs, is uniform throughout the industry and lasts only as long as supply exceeds demand. As soon as supply and demand are in balance, discounts are uniformly abandoned.

Since Canada is the leading producer/exporter in the world, the world price follows the prices set by the companies in Quebec. Since the Johns-Manville Corporation clearly dominates the Canadian industry, Canadian pricing policy and free world prices are established by one company. All other companies follow suit. The evidence reveals asbestos to be an oligopolistic industry, both domestically and in a worldwide sense, having monopolistic pricing practices.

The effect of the 1970 Canadian dollar revaluation was not as would be determined by the theory of price elasticity of demand as a result of the multinational character of the industry. Prior to the revaluation, the American construction industry was

in a recession, causing the supply of asbestos to exceed demand. Canadian companies discounted their list prices as a temporary measure, until the American construction industry resumed its growth. Exports were priced after the revaluation at the same Canadian dollar price as prior to the revaluation, in spite of the excess supply situation. Since Canadian producers are controlled by large American corporations that purchase almost half of the production of Canadian mines, it is customary for the cost of Canadian asbestos to be absorbed in the overall cost structure of the American companies, in the same way that the cost of Canadian whiskey is absorbed by the American affiliates of Canadian distillers. To a lesser degree the same applies to asbestos exports to Europe. Faced with a Canadian dollar revaluation the American (or European) affiliated companies either absorb the additional cost in their cost structures or the Canadian producers give larger discounts from their list prices to compensate for the additional costs in foreign currencies. In either case, any possible effects of a revaluation on the retail prices of products using asbestos or on the consumption of asbestos are eliminated. Consumption of Canadian asbestos remained relatively constant in 1970 and 1971, reflecting the effects of a construction recession in the U.S. rather than increased export prices.

About the time of the Canadian and American dollar devaluations (in late 1971 and early 1973) the markets for asbestos were becoming firmer. Canadian producer/exporters took the opportunity

of the devaluations to reduce, and then eliminate, the industrywide discounts. This nullified the possible price effects of the devaluations on demand and on real Canadian prices and is consistent with the past behavior of Canadian producers. Thereafter, Canadian producer/exporters resumed their yearly price list revisions, since supply and demand were, once more, in balance. After 1972 asbestos exports expanded even though list prices increased and discounts were eliminated. This was especially evident in Japan where tonnage increased by more than 50% in 1973.

As stated previously, asbestos is a highly concentrated industry, both in Canada as well as in countries that have traditionally purchased a very large percentage of Canadian production. The major Canadian producers are affiliated with each other through the ownership of share capital and are, in turn, controlled by their American counterparts. In addition to this, Canada supplies about 60% of the world's demand in excess of the world's domestic supplies. There is evidence linking Canadian export prices with the relationship between demand and supply in such a way that exchange rate changes involving the Canadian dollar will either be absorbed by Canadian producer/exporters or by their customer affiliates. It is the overall, multinational, structure of each company that decides when retail prices change, rather than the general effect of revaluations and devaluations.

IV NEWSPRINT

In 1961 newsprint exports were of far greater relative importance than in 1974: 13.2% of total Canadian exports and 27.4%

of class 4 exports, versus 5.5% and 16.2% respectively, in 1974. Although the value of newsprint exports has increased 126% over the period, it has not keep pace with most Canadian exports, mainly as a result of the low increase in exported volume (39.1%), which, in turn, is the result of small increases in production capacity.

For the most part, Canadian exports have traditionally been shipped to the U.S. market, which alone accounted for 79% of the value of newsprint exports in 1974 (down from 83% in 1961). Since 1964 Canada's share of the U.S. import market has exceeded 95% (table 4-12), and imports from Canada have accounted for 15.4% of the value of U.S. domestic shipments. Aside from the U.K. (which purchased 6.2% of Canadian exports in 1974), very little is exported to Western Europe (which is supplied by the Scandinavian producers). Canada's other major markets are Australia, India, Argentina, Brazil, Venezuela and Mexico (which together bought 7.7% of newsprint exports in 1974). For each of these countries, newsprint imports from Canada represented a major share of their total 1974 imports from Canada (ranging from 5.7% for the U.K. to 25.5% for Argentina).

Canada is the world's largest exporter of newsprint. About 90% of domestic production is exported. Since 1961, Canada has supplied around 70% of total world exports (the world's top four exporting countries supplied 91.2% of all exports in 1970).[1]

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[1]See table 4-3.

Industrial Structure

Canadian newsprint is a moderately concentrated industry. The 4-firm concentration ratio was 36%, the Herfindahl index, 0.0506. Both levels indicate that the largest firms within the industry are of approximately equal size. The American industry has a higher concentration level, the 8-firm CR being 88% and the 4-firm CR, 57%. However, the reason for the relatively low level of concentration in the Canadian industry is explained below.

Most Canadian firms are vertically integrated, from the cutting of trees to the manufacture and selling of the final product. In general, each company operates a minimum cost plant, but the cost of entry into the industry is high (approximately $50 million in the 1960s). At least 80% of the mills produce only five products or less. There is no real product differentiation. Any possible differentiation through assurances of regular supplies, terms of payment, etc. have been minimized by industry associations that provide detailed intra-industry exchange of credit and sales information.[1] The basic product is sold to buyers on the basis of recognized standard specifications agreed to by all producers. Brand or trade names are non-existent. Quality differentials are insignificant.

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[1] Systems Research Group, Competitive Structure in the Canadian Pulp and Paper Industry, 13 (not dated).

Pricing

> World demand for pulp and paper products is strongly dependent on per capita income and total population. At low per capita income levels demand ... is income elastic. In fully developed countries this elasticity has disappeared .... The demand for (pulp and paper) products is probably inelastic with regard to price .... Even when paper costs are a high fraction of the total, as in newspapers, the commodity itself faces an inelastic demand.[1]

According to the same report, the price elasticity of demand for newsprint was -0.1, indicating an inelastic derived demand for products of the Canadian pulp and paper industry. Hayes, in his thesis, divided the product elasticity issue into price increases and price decreases: newspapers are made up of advertising space and news, whose proportions vary; advertising space is inelastic, whereas news space is elastic. When newsprint prices rise the profitable advertising content of newspapers remains relatively constant while the amount of space devoted to news is reduced. Per contra, when the price of newsprint falls, advertising content remains constant and news content increases slightly. Thus demand is inelastic for price decreases but somewhat more elastic for price increases.[2]

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[1] Ibid., 9.

[2] Francis J. Hayes, "An Analysis of Competition in the Pulp, Newsprint, Wrapping Paper, Fine Paper, and Paperboard Sectors of the Canadian Pulp and Paper Industry" (unpublished Ph.D. dissertation, McGill University, Montreal, 1960), 113.

Even recent increases in world demand do not indicate similar increases in world demand for imports. Since 1960 countries have tried to stimulate their own domestic newsprint production. In Japan, newsprint consumption rose 177% between 1960 and 1970, yet increased import demand accounted for less than 10% of this increase with increased domestic production accounting for 90%. This situation reflects the efforts of other industrial countries to reduce their reliance on newsprint imports to satisfy their domestic markets.[1]

The demand curve facing both the industry and firms combines the characteristics of an industry made up of efficient firms of approximately equal size, a product that is homogeneous and standardized, and inelastic user demand. In such a situation individual firms will face highly elastic demand curves, while the industry as a whole faces an inelastic demand curve. "Thus the individual incentive to cut prices is strong, while the result of full price competition is an immediate drop in price to short-run marginal cost ...."[2] This is a classic example of an oligopoly, with member firms facing a kinked demand curve. "In such a situation ... producers will recognize their total interdependence .... [and] joint action is to be expected even when the total number of producers is large."[3]

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[1] The Competitive Position of the Quebec Pulp and Paper Industry, (The Council of Pulp and Paper Producers of Quebec, 1972), 32.

[2] Systems Research Group, op. cit., 24-25.

[3] Ibid.

The problem has been aggravated by periods of excess capacity which forced producers to act in tacit collusion to avoid price wars. This elimination of price competition, in effect, decreased the elasticity of the individual firm's demand curve.

> Excess capacity and high fixed costs tend to place a premium on volume rather than price.... The situation is further aggravated by the fact that, in general, the output of any one producer is sufficiently large to influence the price and production policies of the others. At the same time, no one firm is large enough to exercise effective monopoly control.[1]

For the last fifty years the North American newsprint industry has been characterized by uniform pricing, policed by the firms themselves and by the Canadian provincial governments affected by newsprint production. Instituted in the 1920s, zone pricing fixed the prices charged by all major newsprint manufacturers throughout the U.S. and Canada. Price leadership, at first by International Paper, merely set the pricing trend to be followed by all the other firms within the industry. Since World War II, price leadership by one firm has given way to sales under long-term contracts of from five to fifteen years, with prices set by the "interlock" clause: by reference to the lowest price set by any mill, or to the average of prices charged by recognized price leaders. Therefore, "...the accepted tool for directly restricting the possibility of price competition is the open price contract

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[1]Hayes, op. cit., 116.

with interlock clause ...., [which] can be viewed as a device which ensures that all firms realize they will move along the industry demand curve if prices are cut."[1]

A review of Canadian and American wholesale newsprint prices during the 1960s and early 1970s reveals a pattern that follows exactly that to be expected of a highly concentrated, oligopolistic industry. The basic difference between the Canadian and the American prices listed in table 5-5 is freight charges included in the American wholesale price that are not included in the Canadian equivalent. This difference has amounted to approximately 6% (resulting in the Canadian price being 6% less than the American price). From 1961 to 1973 there were two changes in the relationship between the Canadian and American prices: from the second half of 1961 and the beginning of 1962 the Canadian price rose about 8.6% relative to the American price, and between the first half of 1970 and the first half of 1971 the Canadian price fell about 12% relative to the American price. Both price changes coincided and offset unilateral exchange rate changes involving the Canadian dollar. In 1961 the Canadian dollar was devalued by 8.6%. Therefore, by increasing the Canadian wholesale price, Canadian producers eliminated any advantage that might have accrued from the devaluation, as the relative Canadian/American price remained constant. Similarly, in 1970, when the Canadian dollar was revalued by about 12%, the Canadian wholesale price of

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[1] Systems Research Group, op. cit., 24-25.

TABLE 5-5

Newsprint Prices

	Canadian $ per 2000 lbs.[1]	U.S. $ per short ton[2]	Canadian price/ U.S. price
1961 first half	115.8	134.4	.862
second half	120.7	134.4	.898
1962 first quarter	122.5	134.4	.911
rest of year	125.8	134.4	.936
1963	125.8	134.4	.936
1964	126.0	134.4	.937
1965	125.5	132.4	.948
1966 first quarter	125.2	132.4	.946
second quarter	127.1	134.4	.946
last half	131.3	138.4	.949
1967 first half	131.7	138.4	.952
second half	134.0	141.4	.948
1968 first half	134.5	141.4	.951
second half	132.8	141.4	.939
1969	138.5	146.1	.948
1970 first half	142.5	150.5	.947
second half	133.7	150.5	.888
1971 first half	130.0	153.7	.846
second half	138.9	158.1	.879
1972	139.5	163.7	.852
1973 first half	143.2	168.6	.849

Notes: 1. Price FOB Quebec mills.

2. Price delivered to principal ports.

Source: United Nations, Commodity Yearbook.

newsprint fell by the same percentage. Such action by Canadian newsprint producers parallels oligopolistic theory and is to be expected in an industry that is highly dependent upon exports to the U.S. and whose influence in export markets is not considerable as a result of general excess capacity and inelastic consumer demand.

In summary, "[t]he newsprint industry [is] an oligopoly of efficient firms which, in the absence of substantial barriers to entry, prevent(s) overcrowding by a low price policy".[1]

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[1]Eastman and Stykolt, op. cit., 276.

CHAPTER 6

SUMMARY AND CONCLUSION

By using traditional market structures, as developed in the theory of the firm, and applying them to international trade theory within a framework of partial equilibrium, this thesis has analyzed the relationship between price changes, as theoretically derived from exchange rate changes, and the demand for commodity exports.

In chapter 2 the "classical" or price elasticity approach to balance of trade adjustment, commonly referred to as the Marshall-Lerner condition, was examined, together with the results of studies that have been carried out to lend empirical validity to the responsiveness of consumer demand to export commodity price changes. The results of this review are two-fold: first, the price elasticity approach relies heavily on the existence of perfectly competitive conditions as characterizing international commodity markets; second, there is no consensus among researchers regarding the size of the relevant price elasticities themselves. As a result, it cannot be hypothesized, a priori, that an exchange rate change will improve the export portion of a balance of trade imbalance, since the necessary conditions for such an improvement are a perfectly competitive market structure plus sufficiently large price elasticities of demand for traded commodities. The first condition can only be determined by studying the actual markets for those particular commodities exported by the country whose currency's value is changing vis-a-vis

the currencies of its trading partners. The second condition has yet to be consistently estimated on a commodity-by-commodity and country-by-country basis, in studies employing disaggregated data.

This leaves the "classical" approach, which still forms the basis of international trade theory as well as governmental policy, dependent on perfectly competitive market conditions. Chapter 3 analyzed the various market structures that form the basis of price theory (perfect competition, monopoly, monopolistic competition and oligopoly) in order to determine which, if any, can accomodate the price effects of exchange rate changes without home country firms theoretically expanding their share of export markets to the exclusion of foreign producers or having their markets, both domestic and export, completely taken over by foreign producers. If market structures exist that can accomodate exchange rate changes without these unrealistic results, it will be the theory of these market structures that will determine the effect of exchange rate changes on final market prices. Only when exchange rate changes affect the market prices of exported commodities will consumers respond according to "classical" theory. Therefore, consumer responsiveness to exchange rate changes will affect only those exported commodities that are traded within market structures that produce both realistic, traditional results and allow exchange rate changes to affect final market prices.

The analysis in chapter 3 reveals that only a monopolistic or oligopolistic market structure can accomodate international commodity trade given changing exchange rates, without obtaining the above non-traditional and empirically unobservable results. Since there is no evidence that pure monopoly characterizes the markets for any widely consumed commodity, we are left with oligopoly as the only theoretical and empirically observable market structure that will support individual firms in all markets in the long-run. Oligopoly, however, neglects price as a variable in firm decision making. Oligopolistic firms are primarily concerned with the reaction of their competitors to their own decisions and vice versa. Pricing decisions are considered on an industry-wide level. Therefore, if oligopoly characterizes the markets in which exports are traded, the price effect of exchange rate changes will not necessarily be reflected in final market prices. Consumer reaction will be pre-empted due to firm behavior. It will be meaningless to analyze the demand for exports as a function of price. The "classical" approach to examining balance of trade imbalances will, in these circumstances, be devoid of practical meaning.

The purpose of chapter 4 was to determine the extent to which Canadian export industries are highly concentrated (i.e. oligopolistic). By classifying Canadian exports from 1961-1974 according to the levels of industrial concentration developed by Joe Bain, it was estimated that 75% of all Canadian exports are produced within highly concentrated industrial structures, such that

it can be said that the firms involved practice monopoly pricing. Only 11.8% of all exports could be classified as basically competitive.

When applying the same concentration criteria to the American and British markets for the same industries, the results showed at least as much concentration as the Canadian industries themselves. The American statistics revealed that 77.4% of Canadian exports enter highly concentrated American markets, while only 13% are marketed under competitive conditions. The British statistics approximated those of their Canadian counterparts: 80.8%, highly concentrated, and 11.3%, competitive.

The industry studies in chapter 5 confirmed the analytical results of the previous chapters. In all cases, product export prices did not change in accordance with traditional international trade theory. Each industry was found to be either highly concentrated (i.e., oligopolistic) or to act as though it were an oligopoly. There was no evidence that any of the exports were marketed in a competitive setting where changing exchange rates would affect exports prices which, in turn, could affect export demand.

As a result my analysis concludes that:

1. given the traditional theory of the firm and changing exchange rates, exports can only be marketed within an oligopolistic market structure;

2. the export sector of the Canadian economy is dominated by highly concentrated industries, with little evidence of competition;
3. the corresponding domestic sectors of the American and British economies are as highly concentrated as is their Canadian counterpart.

Therefore, since the theory of oligopoly revolves around the competition between individual firms in the industry and concerns itself with competitors' reactions to any changes that will affect market conditions, price becomes a parameter to the pricing decision in international trade. Under these circumstances, changing exchange rates will not directly affect export market prices. This, in turn, will mean that the market structure that characterizes international trade precludes the possibility that consumers will react to exchange rate changes. It is therefore with little meaning to discuss the price elasticity effects of exchange rate changes on the demand for exports and the resulting changes in trade balances. There is a question as to whether an exchange rate change will remedy a country's trade imbalance. The analysis of this thesis indicates that exchange rate changes will not affect the volume of Canadian commodity exports because of the market structure characterizing the industries involved in Canadian exported commodities as well as in the counterparts in the domestic industries of Canada's major export purchasers.

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