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FOREIGN MULTINATIONALS AND CANADA'S INTERNATIONAL COMPETITIVENESS

Working Paper Number 16
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2. FOREIGN MULTINATIONALS AND CANADA'S INTERNATIONAL COMPETITIVENESS

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EXECUTIVE SUMMARY

In the context of the ongoing policy debate about Canada's international competitiveness, this paper examines the role that foreign multinationals play in shaping Canada's productivity and trade performance – two key factors of competitiveness. The paper reviews theories of the behaviour of multinational enterprises (MNEs) and then tests hypotheses relating to them on foreign- and domestic-controlled establishments in the manufacturing sector for the period 1985-88.

The Productivity Performance of Foreign Multinationals and Domestic Firms

Foreign direct investment (FDI) theories assume that multinational enterprises possess certain firm-specific ownership advantages. In this context, the paper tests the following two hypotheses: first, that the productivity of foreign MNEs operating in Canada exceeds that of Canadian firms; and, second, that the superior technology of foreign MNEs spills over to domestic firms.

An initial comparison of the labour productivity of foreign- and domestic-controlled manufacturing establishments reveals that from 1985 to 1988:

- Value-added per employee was 19 percent higher in the foreign-controlled than in the domestic-establishments of the sample. This advantage increased to 37 percent in medium-sized firms.

- In the same period, value-added per employee in foreign firms was greater across most manufacturing industries. In three of the four largest manufacturing industries (petroleum; paper and allied products; and primary metals) productivity was higher in foreign firms than in domestic firms, but in the fourth industry (motor vehicles) productivity was roughly similar for foreign and domestic firms.

Sources of the Productivity Advantage of Foreign MNEs

The productivity advantage of foreign firms at the level of aggregate manufacturing reflects the distribution of foreign firms across industries and the differences in input use as well as in technology. In order to determine whether the differences in factor intensities and technology are significant, regression analysis was performed. Value-added per employee was regressed onto a series of variables commonly thought to influence productivity, as well as a variable representing foreign control. Labour intensity, labour quality, energy intensity, R&D intensity, and market structure were among the most important of the quantifiable influences on productivity. Scale had a surprisingly low impact, perhaps because of the large size of most plants in our sample or because our proxy was inadequate.

Although trade barriers are not a significant determinant of the productivity of foreign-controlled manufacturing establishments, they do have a strong negative influence on domestic-controlled plants. This result suggests that trade liberalization should narrow the productivity gap between domestic and foreign firms; yet the significance of the foreign-control variable indicates that tangible factors alone do not explain the entire impact of foreign investment.

Technology Spillovers

Industrial-organization theory identifies technology spillovers to local firms as a key benefit of FDI, but testing that theory is difficult. The approach taken in this paper is to see whether the productivity of domestic firms in an industry increases in relation to the extent of foreign ownership. If so, that could be taken as evidence of intra-industry spillovers. The study's results are inconclusive, however.

The analysis of productivity concludes by showing that foreign and domestic firms pay similar wages and use similar proportions of production workers.

Multinationals and International Trade

The role of MNEs in shaping Canada's international trade performance is the second aspect examined. The following three issues are addressed. Are foreign MNEs mere "tariff factories" that exist to service the local market, or are they competitive exporters in their own right? Does trade by MNEs fit into the traditional comparative-advantage pattern? Is there any evidence to support the internalization explanation of intra-firm trade between parents and subsidiaries?

Export and Import Propensities

The paper's findings show that the export propensity of foreign firms is 73 percent higher than that of domestic firms. Some of this disparity is due to the fact that MNEs dominate the export-oriented motor vehicles industry, but a breakdown of the aggregate figure reveals that foreign firms have higher export propensities in most other manufacturing industries as well. Although tariffs may once have induced foreign firms to establish operations in Canada, their subsidiaries appear to have grown into competitive exporters.

Comparative Advantage and Intra-Industry Trade

Traditional explanations of trade patterns relate exports to industries that have a comparative advantage based on relative factor endowments. More modern theories argue that economies of scale and imperfect competition create incentives for intra-industry trade. This study shows that foreign MNEs and domestic firms tend to engage in different types of trade.

While domestic firms tend to do more of the inter-industry trade that results from the comparative advantage, MNEs tend to do more of the intra-industry trade that occurs as a result of economies of scale, product differentiation, and other aspects of imperfect competition.

Intra-Firm Trade

The surge in global foreign direct investment has been accompanied by a growing reliance on intra-firm trade. The ability of MNEs to use intra-firm trade to supply foreign markets gives it greater flexibility in minimizing the total cost of production. The study's sample supports this theory, showing that over 60 percent of the imports of foreign-controlled firms in 1988 were intra-firm by nature.

Industrial-organization theory suggests that incentive problems lead firms to internalize production through FDI instead of licensing their technology to host-country firms. A regression analysis of our 1988 data tends to confirm this view. The paper finds that intra-firm trade is greater in high-technology industries.

Finally, the study finds no evidence to support the hypothesis that foreign MNEs increase their imports from parents, while reducing their capital expenditures. In other words, the results do not indicate that MNEs increase exports from their home country at the expense of production by the host-country affiliates.

Conclusion

The issues raised by the debate surrounding foreign MNEs and Canada's international competitiveness are vast, and this paper cannot settle all of them. The study does, however, examine important aspects of the contribution of MNEs to Canadian productivity and trade performance. The results support the hypothesis that the productivity of foreign MNEs operating in Canada exceeds that of domestic firms. With respect to trade performance, the evidence presented does not indicate that foreign MNEs merely carry out distribution in their host country. The propensity to export of foreign MNEs is significantly higher than that of domestic firms. It is concluded, therefore, that foreign-controlled MNEs enhance the productivity performance of the Canadian manufacturing industry and exhibit a significant propensity to export.

INTRODUCTION

In the past decade, Canadians have witnessed an acceleration of the process of globalization – the growing interdependence of consumers, producers, suppliers, and governments in different countries. Although Canada has always been a trading nation, public concern about the intensification of foreign competition is being expressed more and more frequently. A number of recent studies devoted to Canada's international competitiveness reflect that concern.[1]

Any study of Canadian competitiveness needs to analyze the influence of multinational enterprises, which constitute a crucial link between trade, capital, and technology flows. They collectively account for the vast majority of Canada's total imports and exports, and their importance in world trade has been increasing. Their activities result in cross-border flows of inward and outward foreign direct investment, and their very existence is often said to be related to aspects of technology transfer.

This paper examines the role of foreign-owned MNEs in shaping Canada's international competitiveness, focusing on the years 1985 to 1988 – an important period in the country's recent economic history. During that period, manufacturing production underwent a major expansion, even though Canada's exchange rate had appreciated against the U.S. dollar; energy prices were deregulated; and negotiations eventually led to the signing of the Canada-U.S. Free Trade Agreement. The Foreign Investment Review Agency was replaced by Investment Canada, and inflows of FDI increased significantly.

Unfortunately, the word "competitiveness" has become a notoriously imprecise buzzword. Media reports of competitiveness indicators are often given misleading mercantilist interpretations. As James Markusen (1992) points out, there are two major problems with the current usage of the word "competitiveness": "The first is an inappropriate use of the term in a normative sense in certain situations. Second, the term seems to be used in quite different senses on the macro and micro levels simultaneously." In this study, the term "competitiveness" is used exclusively in its microeconomic sense as a compact reference to both productivity and trade performance. The significance of these latter two terms stems from their effects on the level and distribution of the real incomes of Canadians.

Our definition of competitiveness leads us to focus on the manufacturing sector, for it is the main source of tradeable goods and is the sector in which foreign multinationals have the greatest presence. Furthermore, it is much easier to measure productivity in manufacturing than in the service sector. As will be shown in Chapter 1, however, services

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[1] Economic Council of Canada, *Pulling Together: Productivity, Innovation and Trade*, Ottawa: Economic Council of Canada, 1992; and M. E. Porter, *Canada at the Crossroads: The Reality of a New Competitive Environment*, Ottawa: Business Council on National Issues, 1991.

are becoming an increasingly important component of FDI. The chapter attempts to clarify some of the terminology related to the issue of foreign MNEs and presents a brief description of recent global economic developments. The information presented therein is already in the public domain; hence readers who are familiar with the developments may wish to proceed directly to the next chapter.

In Chapter 2, theories of multinational enterprise behaviour are outlined, and the economic impact of MNEs is examined. New approaches are discussed, such as imperfect capital markets and strategic trade theories; these are not included in most reviews of MNE literature.

Chapters 3 and 4 shed new light on the characteristics and economic performance of foreign multinationals in Canada. The focus in Chapter 3 is on labour productivity and related measures of economic performance. The authors attempt to quantify the determinants of productivity and to track down the sources of differences between foreign and domestic firms. In Chapter 4, the relationships between FDI and the level and pattern of trade are discussed. The extent of intra-firm trade and some of its causes are also covered.

In conclusion, the major findings are summarized, and their implications are discussed briefly.

CHAPTER 1
Multinationals in a Changing Global Economic Environment

MULTINATIONALS IN A CHANGING GLOBAL ECONOMIC ENVIRONMENT

Some Definitions

Much of the confusion that reigns in the debate over MNEs stems from the existence of many different measures of MNE activity and its various definitions. As Julius (1990) points out, there are no international reference sources on FDI comparable to those produced for international trade by the General Agreement on Tariffs and Trade (GATT), the International Monetary Fund (IMF), and others. This makes the analysis and interpretation of FDI statistics even more difficult than that of trade data.

Statistics Canada (1981) defines FDI [on p. 205] as follows:

> Investment motivated by a desire to create or expand some type of permanent interest in a particular enterprise; it normally implies, if not the actual exercise of control, a degree of potential control.

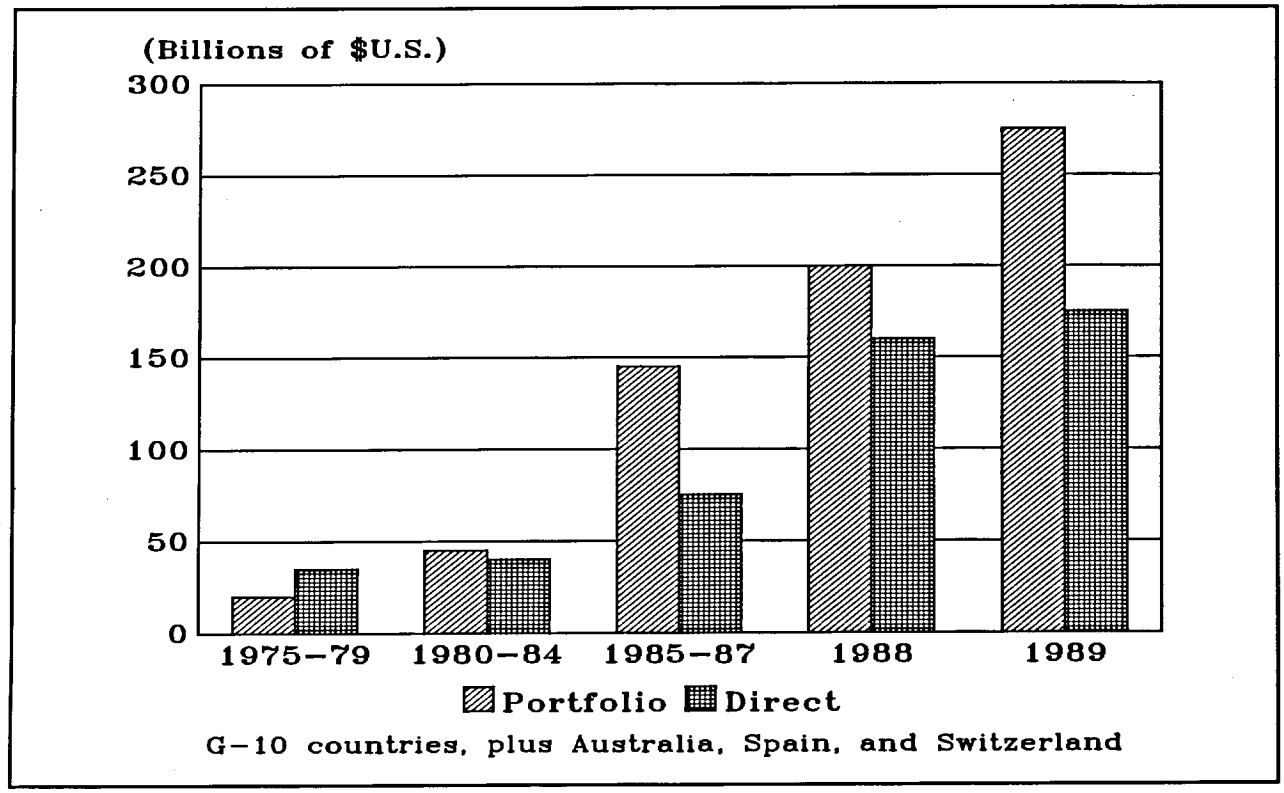
This closely resembles the IMF definition, which emphasizes the motivation of acquiring a "lasting interest" and "an effective voice in the management of the enterprise"; see IMF (1977). It follows that direct investment is unlikely to be highly sensitive to short-term differences in expected rates of return, although surplus funds of foreign-controlled enterprises may move in response to those factors. The capital account of the balance of payments therefore distinguishes between direct investment and portfolio investment, which brings no degree of control and is solely motivated by considerations of risk and expected return. Although the value of such portfolio flows has recently surpassed that of direct investment flows (Chart 1-1), we shall focus only on the latter measure here.

Although the IMF's definition of FDI is widely accepted, there is still no agreement on how to render it operational. The Organisation for Economic Co-operation and Development (OECD) recommends that 10 percent ownership of the voting stock of an enterprise be considered "a lasting interest." Canada and the United States follow this recommendation, but countries like the United Kingdom and France use a 20 percent minimum rule. This discrepancy is not as important as it may appear, since "most FDI is associated with ownership shares in excess of 50 percent"; see Julius (1990).

The criteria used to define a firm as foreign-controlled also differ from those which establish an inflow of FDI. Foreign control usually exists if more than 50 percent of the voting equity is held by an individual or corporation of foreign residence. Effective control is, however, also said to exist in other circumstances – for example, when a person has the largest block of voting equity in a corporation and that holding exceeds one-third and is larger

than the combined percentage of the two next largest blocks. For a detailed discussion of measurement issues relating to FDI flows and foreign control in Canada, see Krause and Swimmer (1992).

Chart 1-1
Average Annual Gross Capital Outflows from Industrialized Countries, 1975-89



Source: Bank of International Settlements.

Defining the nationality of investors is also a complex matter, since they are usually firms and not actual people. As Graham and Krugman (1989) point out,

> if a firm is conceived of as an organizational entity that sprawls across national boundaries, it does not make obvious sense to speak of the firm as a resident of any one of the countries in which any of its operations – including operation of a central headquarters – takes place.

Nonetheless, any firm is ultimately owned and controlled by a group of individuals. The nationality of the individuals can be considered to be the same as the nationality of the firm.

Among the different measures of foreign-firm presence, it is useful to distinguish between two groups. The first consists of balance-of-payments data on FDI stocks and flows. The second consists of financial and operating data on the domestic affiliates of foreign-controlled firms. Balance-of-payments measures of inward FDI flows capture transactions

that lead to cross-border flows of funds, such as purchases of equity or net lending from parents to subsidiaries. In addition, most countries include the retained earnings of foreign subsidiaries as part of inward FDI flows, because if those earnings were to be distributed through a dividend flow back to the parent, they would be recorded under "interest, profits, and dividends" in the current account. Thus consistency requires that retained earnings be recorded as an increase in FDI into the foreign country. The United States , Britain, and Germany follow that method; France and Japan do not. Statistics Canada does not include retained earnings in its measures of FDI flows, but it does add them to the stock of FDI.

A major problem with balance-of-payments measures is that acquisitions or expansions by foreign subsidiaries financed by local capital markets are completely ignored in both stocks and flows of FDI. An indication of the magnitude of this problem, according to Graham and Krugman (1989), is that 83 percent of the debt and current liabilities of U.S. affiliates of foreign-controlled firms is owed to U.S. residents. A second problem relates to the use of book value when measuring the stock of FDI, since such investments are not revalued over time to reflect increases in their actual worth. Julius (1990) argues that this leads to an understatement of FDI stocks that is "especially serious for those countries with a long history of foreign investment." Furthermore, the extent of this bias may fluctuate over time, thereby making detailed sectoral breakdowns appear erratic.

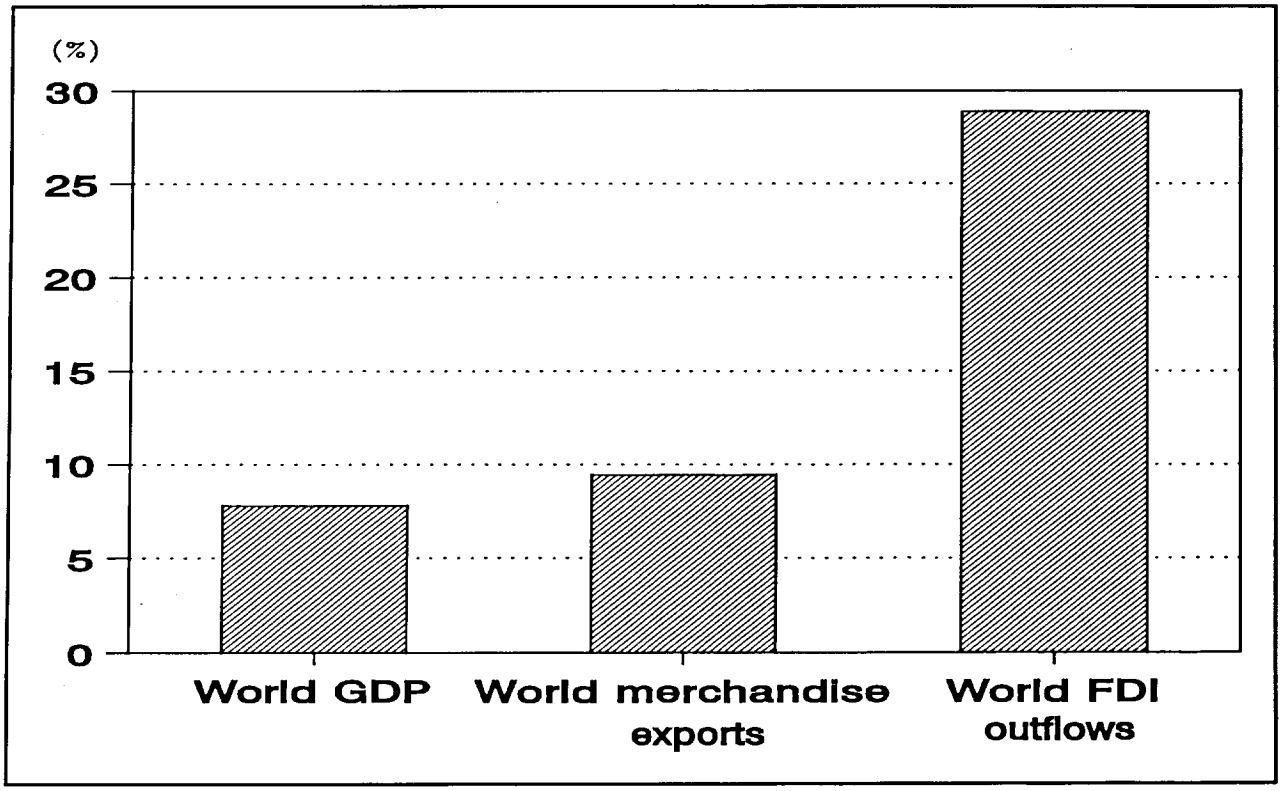
The alternative to balance-of-payments measures of multinational activity is financial and operating data on Canadian affiliates of foreign firms. The shares of sales, value-added, employment, and assets of foreign-controlled firms (FCF) are among the most common of such measures. These have the advantage of enabling more detailed breakdowns than do balance-of-payments measures, but they are not as current and only capture one aspect of foreign control. Clearly, there are many opportunities for discrepancies between FDI and FCF measures. For example, if a foreign firm increases its stake in one of its affiliates, that will lead to an increase in FDI but not in any FCF measure. If FDI is increasingly directed towards capital-intensive industries with low value-added and employment per unit of capital, the FCF shares of those will increase relatively less than FDI. Measures of FCF shares of total assets can also be misleading, since the latter are dominated by financial firms. More appropriate comparisons are those made between the assets of foreign-controlled manufacturing firms and those of domestic-controlled manufacturers; see Graham and Krugman (1989).

Much of the confusion created by these different measures seems to stem from the fact that the IMF definition does not distinguish between the different types of direct investment purchased (e.g., mergers and acquisitions, equity increases, new plants, capacity expansion, or real estate) or between different forms of finance (e.g., retained earnings, transfers from the parent, or local borrowing). These distinctions can be very important in different applications. For example, the balance of payments focuses on cross-border flows and thus, as noted, understandably ignores investments financed by local borrowing.

Foreign Direct Investment in the 1980s

Most of this paper is devoted to an analysis of data on the activities of foreign-controlled firms in Canadian manufacturing between 1985 and 1988. It is important, however, to put those activities in their global and historical context by briefly reviewing trends in FDI. Note a few phenomena that will not be investigated in this study but are nonetheless quite important.[2]

Chart 1-2
Average Annual Compound Rate of Growth in World GDP, Exports, and Direct Investment Outflows, 1983-89



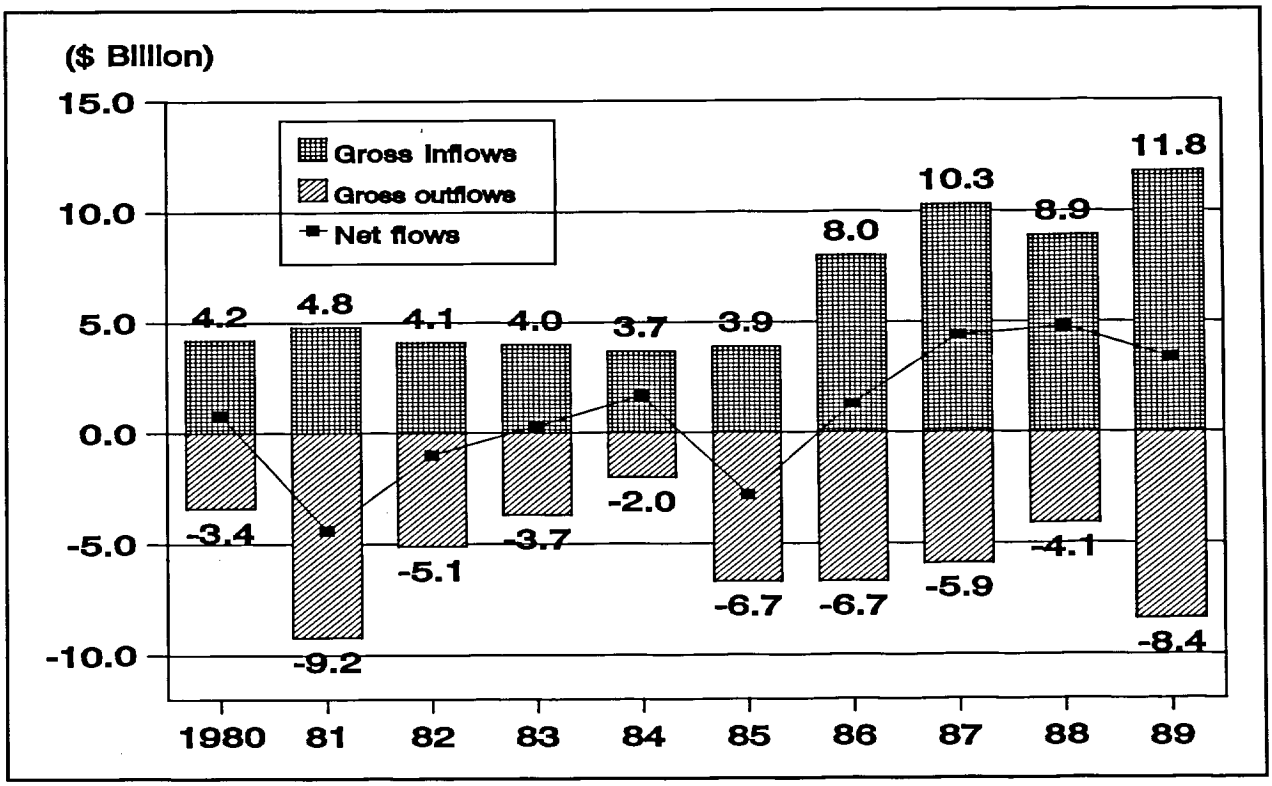
Source: United Nations Centre on Transnational Corporations (UNCTC), *World Investment Report*, 1991.

The 1980s saw a dramatic increase in the extent of direct investment abroad. As shown in Chart 1-2, world outflows of direct investment grew at a much faster rate between 1983 and 1989 than did world trade, which in turn grew faster than world output. This pattern is in contrast to that of the two previous decades, in which direct investment grew less quickly than trade. Therefore, during the 1980s, multinational enterprises became a relatively more powerful force for global economic integration. Most analyses of the effects of such

[2] The discussion that follows draws heavily upon Investment Canada (1990).

integration assume that it occurs through trade, but economic integration that occurs through FDI may have quite different effects.

Chart 1-3
Increase in Net Flows of FDI into Canada, 1980-89

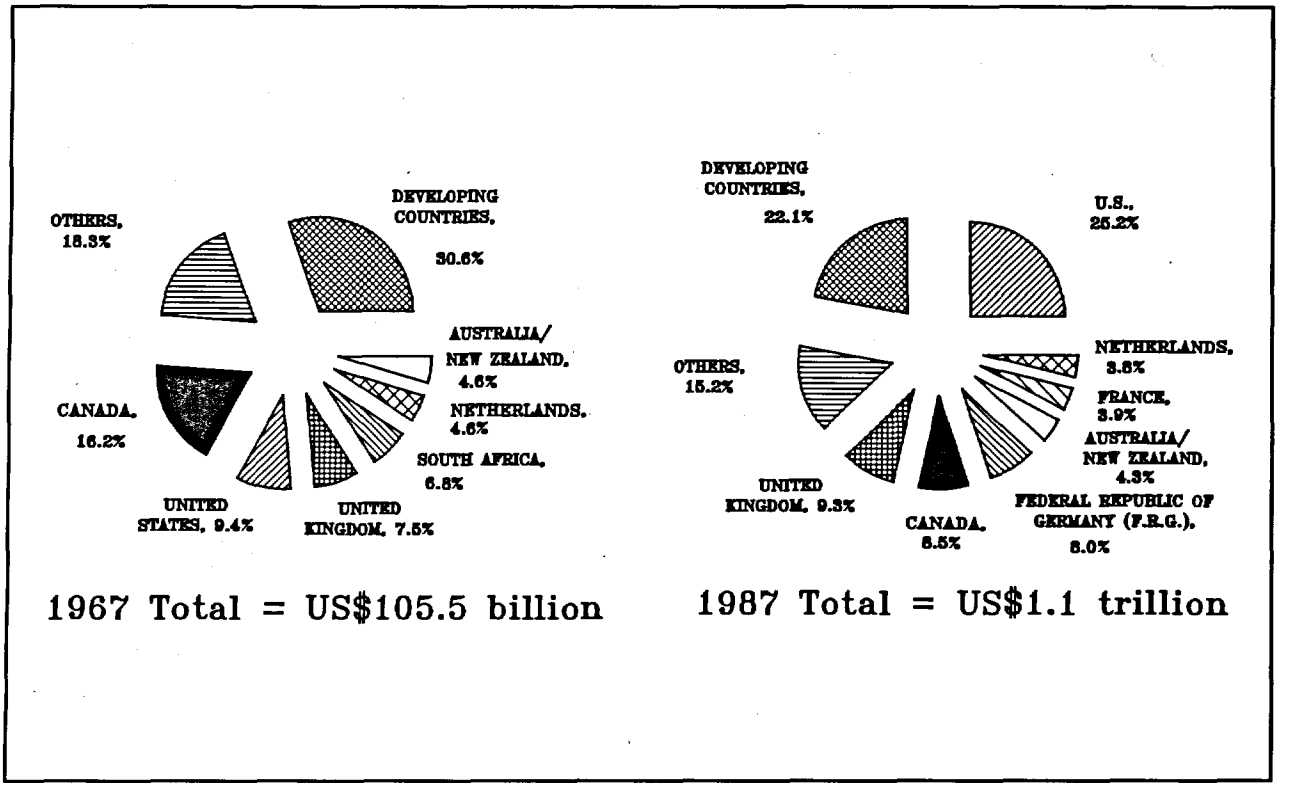


Source: Statistics Canada

Chart 1-3 details Canada's recent experience. It shows that while gross inflows of FDI were relatively stable from 1980 to 1985, there was a sizeable increase during the second half of the decade. This study therefore focuses on a period of Canadian and world economic history marked by large increases in FDI.

The growth in FDI was accompanied by an equally remarkable shift in its distribution among countries. Chart 1-4 shows that Canada had a disproportionate share of the world's stock of inward direct investment in 1967, but this share had shrunk by 1987. Meanwhile, the United States experienced a change in the opposite direction, with its share of the stock of inward direct investment having increased. One of the principal lessons to be drawn from these figures is that while the Canadian economy was among the first to experience substantial foreign MNE involvement, that experience is now less and less unique. Countries like the United States are now undergoing a debate over FDI that is quite similar to the one that occurred in Canada.

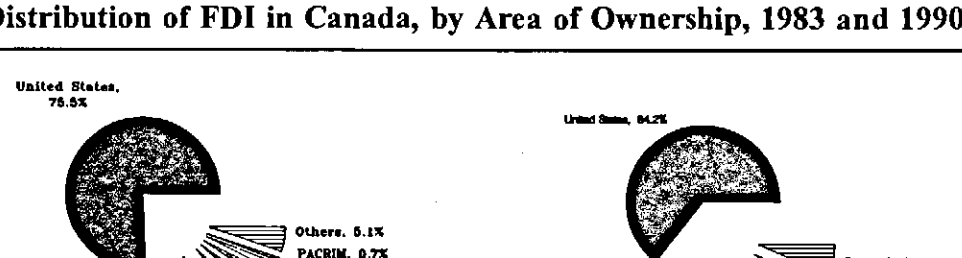
Chart 1-4
World Stock of Inward Direct Investment, by Major Host Countries, 1967 and 1987



Source: U.S. Department of Commerce.

In spite of those concerns, the United States remains a dominant economic power and still accounts for over 70 percent of FDI in Canada, although its share fell during the 1980s (Chart 1-5). The United Kingdom is the other major source of FDI, and surprisingly its importance has increased. Japan accounts for only a fraction of FDI, but it is the fastest-growing of the major source countries (Chart 1-6). Growth in FDI from the smaller Pacific Rim nations, especially Hong Kong, was even faster.

Chart 1-5
Distribution of FDI in Canada, by Area of Ownership, 1983 and 1990



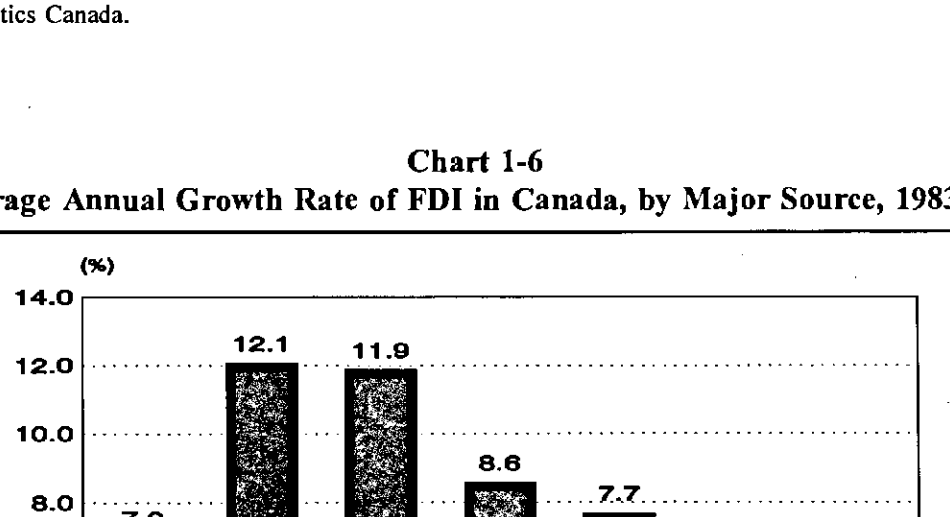
1983 Total = $77.4 billion

1990 Total = $125.3 billion

* The Pacific Rim (PACRIM) excludes Japan.

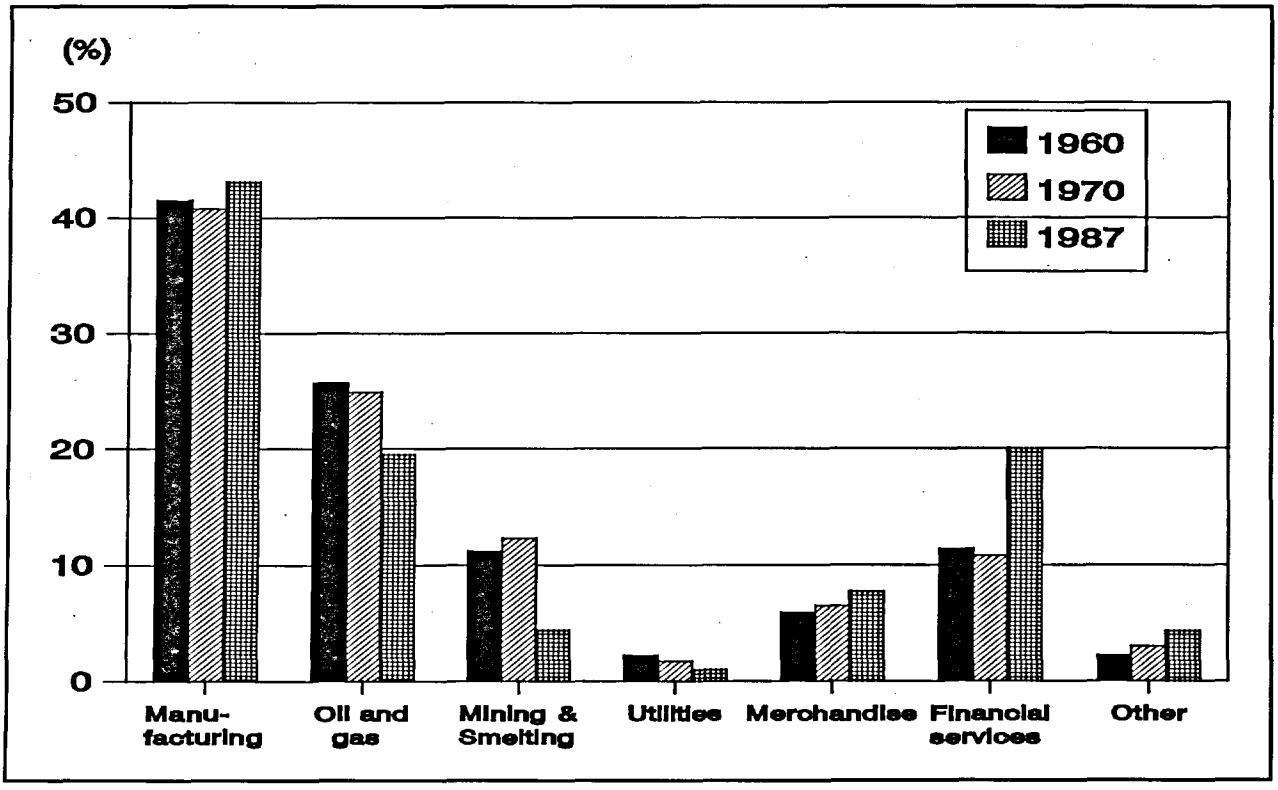
Source: Statistics Canada.

Chart 1-6
Average Annual Growth Rate of FDI in Canada, by Major Source, 1983-87



Source: Statistics Canada

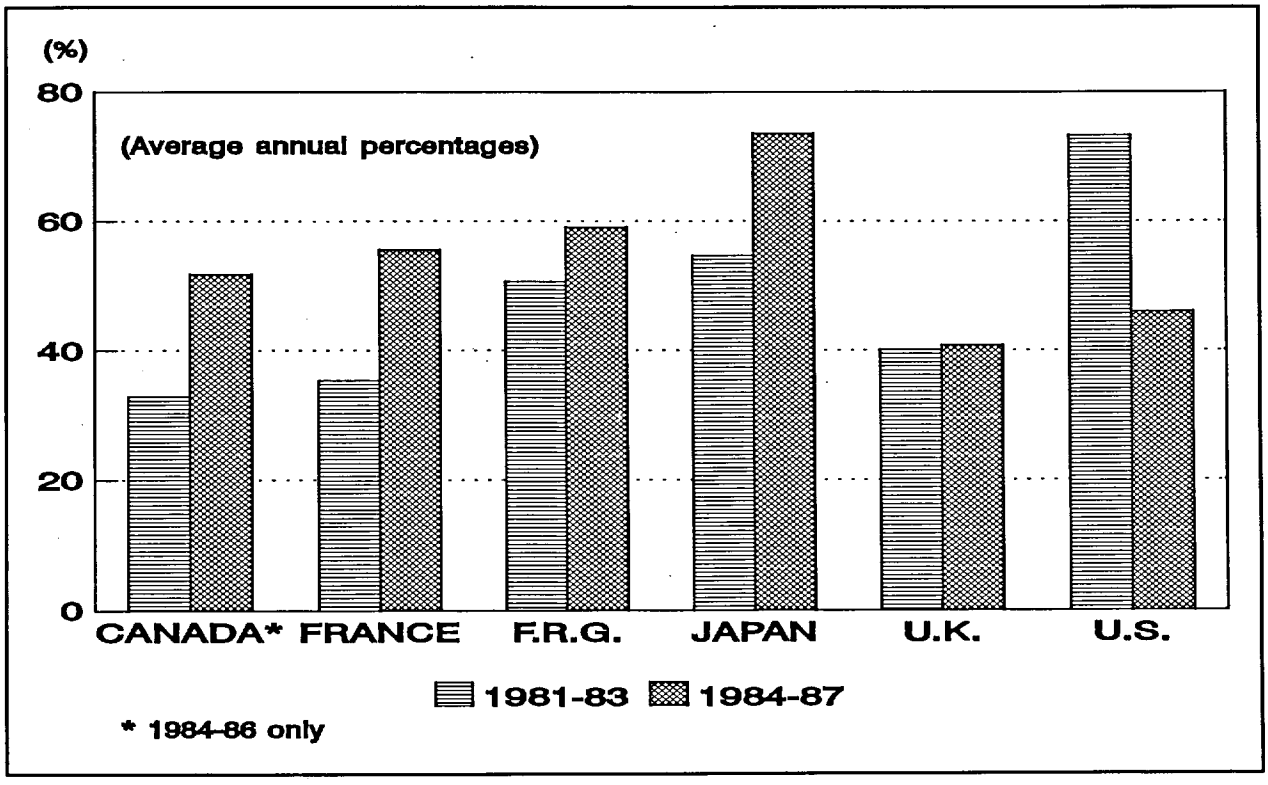
Chart 1-7
Distribution of FDI in Canada, by Industry, 1960, 1970, and 1987



Source: Statistics Canada

The lion's share of FDI in Canada is directed towards the manufacturing sector, and this has changed little over the past three decades (Chart 1-7). Financial services have overtaken oil and gas since 1987, however, to become the sector with the second highest share of FDI. In fact, the growing attractiveness of the service sector as a destination of FDI is a global phenomenon. Services have gained a greater share of outward investment in most industrialized countries, with the exception of the United States (Chart 1-8). When this phenomenon is considered, together with the long-standing trend towards a larger share of the service sector in economic activity, it raises a number of interesting questions concerning the future of world trade. For example, given the traditional perception that services are largely non-tradeable, is FDI bringing the benefits and costs of economic integration to the service sector that cannot be brought through trade? What effect does FDI in the economy's tradeable-goods sector have on the tradeable-goods sector's competitiveness? While the focus of this study is on the manufacturing sector (and hence there will be no attempt to answer those questions), the importance of multinational enterprises in the service sector is a topic that merits further investigation.

Chart 1-8
Services as a Proportion of FDI Outflows from Developed Economies, 1981-87



Source: Based on National Data from UNCTC.

CHAPTER 2
The Multinational Enterprise: Theory and Economic Impact

THE MULTINATIONAL ENTERPRISE: THEORY AND ECONOMIC IMPACT

The causes and effects of FDI have been analyzed elsewhere within the framework of theories of investment, location, industrial organization, and international trade. Given that many surveys of this voluminous literature already exist – (e.g., Safarian (1984) and Lizondo (1989) – this paper attempts only to draw out the principal themes in the literature, placing special emphasis on recent developments.

The Causes of Foreign Direct Investment

Theories of FDI fall into two categories. The first emphasizes *capital-market* causes (expectations of rates of return, risk, and the relative cost of raising debt and equity); the second emphasizes *industrial-organization* causes (transaction costs and oligopolistic rivalry). Policy towards FDI calls for an assessment of both the benefits and the costs that these theories point.

THEORIES OF FOREIGN DIRECT INVESTMENT

Capital-Market Approach

* Differences in expected rates of return.
* Advantages of internal financing because of capital market imperfections.
* Effects of the exchange rate on relative net wealth.

Industrial-Organization Approach

* Ownership of intangible firm-specific assets – e.g., superior technology, managerial talent, advertising, and R&D.
* Locational advantages because of tariffs, transportation costs, and low relative factor prices.
* Internalization advantages because of the higher costs of arms-length market transactions relative to direct managerial control.

The Capital-Market Approach

The capital-market approach to FDI gained wide acceptance in the late 1950s but has since fallen out of favour. Early studies argued that FDI is the result of cross-country differences in expected rates of return. According to this view, multinational enterprises are simply arbitrageurs of capital, moving it from countries where its return is relatively low to those where it is high. These capital flows continue until relative factor endowments, and thus factor returns, are equalized. Given that trade depends on differences in factor endowments, foreign investment acts as a substitute for trade. Tax credits and other incentives, by affecting after-tax returns, encourage inflows of foreign capital.

As Stephen Hymer (1960) first pointed out, however, this view of FDI is inconsistent with a number of stylized facts. First, some countries are both importers and exporters of FDI. Second, FDI is unevenly distributed across industries. Third, the theory does not explain why direct investment instead of portfolio investment is chosen. Finally, an important share of FDI is financed locally, where the cost of capital is presumed to be higher.

A recent paper by Kenneth Froot and Jeremy Stein (1989) shows how a more sophisticated capital-market theory can explain these stylized facts, as well as why massive FDI inflows to the United States accompanied the dollar's depreciation during the late 1980s – a phenomenon that gave rise to fears of a "fire sale" of U.S. assets. This theory assumes that borrowers and lenders have different information. Such capital-market imperfections cause external financing to be more expensive, so that the greater a firm's net wealth, the lower its cost of capital. Consequently, according to this theory,

- portfolio investments can be distinguished from direct investments because they require less information and are therefore more readily financed with external funds;
- firms may borrow in the host country if that will reduce exchange rate risks;
- differences in information problems across industries explain two-way FDI flows;
- a currency depreciation, by lowering the relative wealth of domestic firms, leads to an increase in foreign acquisitions.

Froot and Stein show that there is a significant correlation between *"detrended"* inflows of FDI to the United States and the exchange rate. These exchange rate effects are "strongest ... in transactions (such as mergers and acquisitions) involving a transfer rather than an expansion of existing assets." Klein and Rosengren (1990) provide further evidence that the correlation between FDI and the exchange rate is "mainly attributable to the role that the exchange rate plays in altering relative wealth", rather than its effect on relative labour costs.

As Graham and Krugman (1989) point out, however, the new capital-market theory cannot explain either the long-term trends of FDI or the existence of intra-industry FDI. Furthermore, Froot and Stein did not find a statistically significant relationship between exchange rates and FDI in Canada. For those reasons, the issues raised by the imperfect capital-market approach to future research are not discussed herein.

The Industrial-Organization Approach

The problems with the traditional capital-market explanation of FDI eventually led most economists to abandon it in favour of the industrial-organization approach. Stephen Hymer (1960) was among the first to argue that MNEs exist in imperfect product markets. These imperfections may arise for structural reasons, such as market power and barriers to entry, or for efficiency reasons that induce the MNE to substitute internal for external transactions.

Ownership

Kindelberger (1970), Caves (1971, 1982), and Dunning (1972) built on Hymer's work. These authors contend that a firm undertaking production in a foreign country must overcome disadvantages arising from its relative lack of knowledge about the economic, social, political, legal, and cultural conditions in the host market. To offset those disadvantages, the foreign firm must possess specific *ownership* advantages. Caves (1982) classifies these as: 1) technological advantages in products and processes; 2) superior managerial talent; and 3) multi-plant economies of scale (or economies of scope), the main sources of which are in marketing, advertising, administration, and research and development. These intangible assets have the property of being a public good within the firm; i.e., their services can be provided to several production facilities at near zero marginal cost. A great deal of empirical evidence points to the importance of these factors in explaining the inter-industry incidence of foreign MNEs in Canada [e.g., Saunders (1982) and Meredith (1984)].

Location

The existence of firm-specific ownership advantages explains why a foreign firm would enter the domestic market, but it does not explain the choice of branch-plant production over exporting. On the contrary, economies of scale associated with these advantages should lead to the centralization of production in one country. Consequently, *locational* considerations such as tariffs, transportation costs, and relative factor prices must also be taken into account when explaining the choice of branch-plant production.

Low host-country wages are an example of a relative-factor price difference that creates a locational advantage. While low wages may explain much of the FDI in developing countries, however, natural-resource abundance is a more important motivation in the Canadian context. Even when only the manufacturing sector is considered, the reasons for

MNE presence in resource-based manufacturing (e.g., paper and allied products; primary metals) may differ from those which explain their presence in secondary manufacturing.

An early study emphasizing the importance of the tariff in Canada is that of Eastman and Stykolt (1967). The authors hypothesized that Canadian manufacturers operate as collusive oligopolies that price at the level of world prices plus the domestic tariff. Because the tariff protects domestic industries from import competition, MNEs are induced to "leap" the tariff wall and set up subsidiaries in Canada. Although Baldwin and Gorecki (1983) provide strong support for that hypothesis, it is not accepted by all economists. For example, Hazeldine (1991) argues that Canadian firms in low-tariff industries actually perform more poorly than do those in protected industries.

Internalization

Dunning (1972) argues that in order to explain multinational enterprises, a third condition, in addition to the existence of ownership and location advantages, must also be satisfied. *Internalization* is a condition that is also necessary; otherwise, a firm with a knowledge-based ownership advantage would choose to license its knowledge to a producer in the country with the locational advantage.

The internalization approach to FDI uses the theory to explain why technological knowledge is not licensed. Coase (1937) argues that extensive transaction costs are incurred by monitoring certain activities undertaken in markets. Entrepreneurs can improve incentives and enhance profitability by organizing these activities internally. The limits to the size of the firm are drawn by balancing the benefits of internalization with its costs (e.g., bureaucracy; loss of managerial control). According to this perspective, FDI is simply an extension of the limits of the firm across national boundaries.

One drawback to the internalization approach is that it is unclear why monitoring problems must be solved through the firm instead of through the market. As Oliver Hart (1989) points out, "one does not need to look very far to see examples of market solutions to these problems, such as auditing among independent contractors". Furthermore, over the last decade it has become increasingly clear that FDI no longer requires a wholly- or majority-owned subsidiary to exploit firm-specific assets. New organizational forms have arisen,

including joint ventures, franchising, and management and technical assistance contracts. As McFetridge (1989) points out:

> Multinational enterprises can be viewed as the endpoint on a continuum of possible international linkages among producers. A decline in the relative advantage of the multinational form will cause a movement ... in the direction of admitting local partners, joint venturing ... and ultimately licensing.

Trade

The industrial-organization approach to FDI sheds new light on the relationship between FDI and trade patterns. Recall that theories based on capital-market factors lead to the conclusion that FDI and trade are substitutes. Most empirical studies have, however, found a positive correlation between the extent of foreign-affiliate production and the quantity of exports to a country; see, Williamson (1986) and Blomström et al. (1988). Such patterns have led some commentators to view FDI and trade as complements – the exact opposite of the traditional view. For example, Michael Porter (1990) argues that exports and FDI are both reflections of a nation's competitive advantage.

The industrial-organization approach to the question of FDI and trade usually recognizes that the two are neither substitutes nor complements but, instead, jointly determined. As Ethier's (1986) theoretical model shows, there is no causal relationship between direct investment and trade, since both depend, in complex ways, on underlying differences in factor endowments, country size, and technology. These differences create incentives for horizontal or vertical integration of firms across national boundaries, which then determine whether trade volumes and FDI move together or in opposite directions.

The dynamics of FDI and trade are captured by Vernon's (1966) theory of the product cycle, which emphasizes the international diffusion of technology instead of market structure and relative factor endowments. According to Vernon, in the first stage of the cycle, the product is developed in a home country with an edge in innovation. In the second stage, the product becomes standardized and known to foreign markets through exports. Next, production is established in foreign markets because tariffs may be imposed; scale economies are exhausted; and prompt service of the product is required. Finally, the subsidiary reaches the point where it can begin to export.

Benefits and Costs of Inward Foreign Direct Investment

The principal benefits of FDI to a host country are analogous to the gains from international trade. If the MNE possesses a firm-specific asset, FDI will enable the host country to benefit from its services without costly duplication; see Horstmann and Markusen (1989). When competition among MNEs or potential rivals is strong enough, any observed repatriation of "profits" only represents the normal return on the firm's intangible asset.

Furthermore, the establishment of subsidiaries in imperfectly competitive industries can drive down the price of the good to the benefit of host-country consumers. Finally, even if the MNE earns pure economic profits as a result of barriers to entry, host-country labour unions may be able to appropriate some of those rents.

In addition to those traditional gains from trade, FDI can bring external benefits (spillovers). Intra-industry spillovers occur when the introduction of new technology is copied by local competitors. Similarly, the skilled manpower created by the subsidiary's training programs may eventually join domestic firms at no additional training cost. Inter-industry spillovers occur when foreign firms influence their local suppliers and customers to adopt new managerial practices, such as just-in-time inventory methods.

BENEFITS OF FOREIGN DIRECT INVESTMENT

* Makes services from firm-specific assets available without costly duplication.
* Creates spillover benefits from the introduction of new technologies.
* Increases competition to the benefit of host-country consumers.
* Capital-market FDI provides financing that is lacking at home.

COSTS OF FOREIGN DIRECT INVESTMENT

* Potential loss of political/cultural sovereignty.
* Loss of rents in imperfectly competitive markets.
* Potential excessively low acquisition prices because of capital-market imperfections.

Although this paper focuses solely on FDI's economic impact, other authors have pointed to the potential non-economic costs of FDI, such as national security risks or threats to sovereignty. As Richard Harris (1991) explains:

> Clearly, if FDI is an important mechanism by which significant social benefits which are foreign in origin ... are transferred then it is quite possible that the same mechanism (FDI) is capable of facilitating international transfers of some "bads" or "dubious goods". It is this type of resistance to foreign ideas which has made countries like Japan a much less receptive host of FDI than Western economies would consider normal. In Canada ... it is U.S. influence which is the usual source of concern.

There is little doubt that Harris' argument carries weight. Non-economic concerns can also be used, however, to cloak protectionist interests. For example, Graham and Krugman (1989) point to the potential abuse of U.S. restrictions on FDI that are meant to protect national security.

Reduction in employment and trade-balance problems are often alleged to result from MNEs' sourcing from home markets. Given the frequency of references to employment and trade-balance effects in the popular literature on FDI, these criticisms are worth exploring in some depth. In general, as Graham and Krugman (1989) point out, both the level of employment and the trade balance are essentially determined by macroeconomic forces, not by the microeconomic forces behind FDI.

Consider, first, the alleged employment effects of FDI. Critics of FDI in Canada have pointed out that at the level of aggregate manufacturing, foreign MNEs appear to create fewer jobs than do domestic-controlled firms. Other writers, such as Alam et al. (1989), have shown that this is mainly a reflection of the size differences between domestic and foreign firms.

These studies of relative job creation at the sectoral level, however, lack any economic meaning. The level of aggregate employment in the Canadian economy is determined by aggregate supply, except in the very short run. When there is a shortfall in demand, monetary and fiscal policy is the correct instrument for dealing with it. In the long run, an increase in job creation in one sector will be offset by a decrease in another. From an economic perspective, the relevant labour-market issue relating to FDI concerns the level of wages, not the level of employment. The effects of FDI on income distribution in a *host* country are identical to those of any type of inflow of foreign capital or technology, in that labour will benefit in the form of higher wages.

Similar macroeconomic arguments run counter to the alleged problems of the trade-balance effects of FDI. An increase in the propensity to import through sourcing affects the exchange rate. If the exchange rate depreciates, then Canadian goods become relatively less expensive, and more exports are sold. This serves to restore the trade balance.

While these alleged costs of FDI appear misplaced, it does not follow that a laissez-faire approach is always the best policy. In many formal models of FDI, whether based on the capital-market approach or on the industrial-organization approach, there are government policies that can improve domestic welfare. These policies illustrate the theory of second best, which states that when an economy suffers from one type of distortion, removing other distortions may actually decrease welfare. Given that the very existence of MNEs is usually associated with some form of market imperfection, a theoretical rationale for an activist FDI policy may exist.

The nature of optimal policy depends on both the choice of the appropriate model of FDI and the parameters of that model. If FDI occurs as a result of capital-market imperfections, then there is the potential for foreign firms to acquire host-country firms at lower than normal prices. A well-informed government might, therefore, improve welfare by rejecting some acquisitions. If FDI occurs as a result of industrial-organization factors, there is a clear analogy with the case for "strategic trade policies" in oligopolistic markets. As Graham and Krugman (1989) point out, "In the same way that strategic trade policy can in principle act as a beggar-thy-neighbour policy that raises national income at foreign expense, so could an asymmetric FDI policy".

Most of the literature on strategic trade policy concludes that the effects of a country's tariffs on its welfare are quite sensitive to the nature of competition in an industry. For example, Horstmann and Markusen (1987a) and Smith (1987) study the effects of tariffs in oligopolistic industries on the emergence of horizontal MNEs – i.e., firms that produce identical products in several countries. Tariffs increase the cost of exporting, so they create an incentive to substitute branch-plant production for exports. By making it easier for domestic firms to enter the market, however, tariffs are also shown to have an ambiguous "strategic" effect. The desire of the MNE to pre-empt entry is an additional inducement to set up branch plants; but if the tariff succeeds in inducing the host-country firm to enter, the MNE may disinvest and serve the host country through exports.

These two models illustrate the ambiguous role that tariffs can play in attracting foreign investment. Harris (1991) argues, however, that the case for strategic trade policy is weaker in small economies that already have high levels of foreign ownership. The basic motive for strategic trade policy is to shift rents to local firms; but when these firms are foreign-owned, the rents are then transferred abroad to the foreign shareholders.

While the scope of strategic trade policy may be reduced in an economy such as Canada's, there may still be room for a strategic investment policy using FDI restrictions or performance requirements. Horstmann and Markusen (1987b) show how investment policy influences a firm's choice between licensing and FDI when its ownership advantage is its reputation for high-quality products. Under a laissez-faire policy, such a firm will usually choose FDI, because a licensee may find it profitable to "milk" its good reputation by producing a low-quality product at lower cost. Restrictions on FDI may induce the MNE to switch to licensing, thereby improving host-country welfare by capturing the MNE's rents. If, however, the MNE chooses to export from its home base instead, then welfare is reduced.

Davidson et al. (1985) model the impact of performance requirements. They examine minimum export requirements under which foreign firms must export a minimum proportion of output, as well as local-content laws under which firms must use minimum amounts of domestic factors in their production. They show that discriminatory policies improve the competitive position of domestic firms by raising the production costs of foreign-owned firms. The increase in profits can outweigh the host country's loss of consumer surplus when sales by host-country firms are greater than sales by source-country subsidiaries.

As with trade policy, the welfare effects of investment policy in oligopolistic industries are quite sensitive to the parameters of the underlying model. Governments must have extremely detailed information about the economy in order to intervene successfully. Retaliation by other countries should also be considered when contemplating restrictive policies. Consequently, Harris's conclusion – namely, that the danger of unsuccessfully implementing strategic trade policies outweighs any possible benefits – seems to apply to strategic investment policies as well.

Most governments have discriminatory policies towards FDI, although these are not always explicit; see Safarian (1991). One group of restrictive policies – trade-related investment measures, or TRIMs – has become a major concern of the Uruguay Round of the GATT. TRIMs are a form of performance requirements, but it is hard to think of them as being "strategic". According to Graham and Krugman (1991):

> In practice it is doubtful that many nations' motivations for imposing TRIMs stem from a keen sense of potential national gain. Instead, the usual mercantilist bias of trade policy appears to be the principal motivation, reinforced perhaps by the sense that foreign investors can in effect be taxed via the imposition of these measures.

Nonetheless, if foreign firms do have ownership advantages that enable them to earn rents, the question of who receives those rents becomes an important, albeit difficult, one to answer. Host-country consumers benefit from the MNE's firm-specific assets, and the MNE's presence may enable domestic firms to absorb new technologies. The MNE's advantages may, however, also enable it to capture rents that would otherwise have gone to domestic firms.

A complete analysis of strategic trade and FDI policies for Canada would require constructing and calibrating applied general-equilibrium models similar to the one used by Hunter et al. (1991) to study the impact of North American free trade on the MNE-dominated auto industry. The complexity of these models means, however, that such an analysis is well beyond the scope of this paper.

Here, instead, is adopted the more traditional and primitive approach of reviewing a detailed data set, identifying some key stylized facts, and testing a small number of hypotheses. The industrial-organization theory is used to motivate the discussion of the productivity – and trade-performance aspects of competitiveness.

Thus the ownership advantages of MNEs are first assessed in terms of their impact on productivity performance. In Chapter 3, the productivity of foreign- and domestic-controlled firms is compared in order to determine the extent to which differences can be attributed to industry structure, on the one hand, or country of control, on the other. If significant control-related differences exist after tangible industry characteristics have been accounted for, this may indicate ownership advantages. Chapter 3 also addresses the possibility of technological spillovers and their impact on productivity. Chapter 4 looks at the role of MNEs in shaping Canada's international trade performance. It examines aspects of location and internalization

characteristics by comparing export propensities and reviewing the extent of intra-firm trade. This paper is concerned primarily with identifying the impact of MNEs on the patterns and nature of trade rather than with their effects (if any) on the trade balance.

CHAPTER 3
The Productivity Performance of Foreign Multinational Enterprises and Domestic Firms

THE PRODUCTIVITY PERFORMANCE OF FOREIGN MULTINATIONAL ENTERPRISES AND DOMESTIC FIRMS

As noted, most economists adopt an "eclectic" approach to the study of the multinational enterprise, drawing on industrial-organization and trade theories to explain ownership, location, and internalization. This chapter examines several empirical issues raised by theories emphasizing ownership advantages, including the following:

- Productivity differences: Does the ownership of tangible and intangible assets give foreign MNEs in Canada productivity advantages over domestic firms?
- Technology spillovers: Does the presence of foreign multinationals increase or decrease the productivity of domestic firms?
- Related performance differences between foreign- and domestic-controlled firms: Are there differences in labour quality and labour compensation or in the extent to which labour is receiving its share of the value-added "pie"?

Following is a brief description of the sample used herein and a discussion of its drawbacks. Next, an initial comparison is made of labour productivity, which reveals systematic differences between foreign- and domestic-controlled firms. An attempt is made to find the sources of these differences by using regression analysis. In the fourth section, the possibility of technological spillovers is addressed. The last section compares related performance measures, such as labour compensation.

The Data Sample

In this paper, the analysis of productivity and trade performance is based on an extensive database covering the years 1985 to 1988. This sample was created by linking the establishments that responded to Statistics Canada's Capital Expenditure Survey with those which responded to the Census of Manufacturing. (A description of these files and of the relationship between the sample and the universe is provided in Appendix A.)

The authors have used the selection criterion of a response to the Capital Expenditure Survey in order to obtain a set of firms of similar size when making foreign/domestic comparisons and to identify the country of control. This sample has two drawbacks, however. First of all, it is impossible to make meaningful time-series comparisons because not all establishments had sufficient capital expenditures in each of the four years to be included in the survey. The following tables, therefore, present data only for the latest year available or for the average of the years 1985 to 1988. Second, there is a bias towards large plants; hence some of the results may not extend to the entire population of manufacturing firms.

Table 3-1
Share of Manufacturing Sales, by Industry, 1985-88; and Proportion of Industry Sales and Employment Attributable to Foreign Establishments, 1988

Industry	1985-88	1988	
	Share of sales, by industry[a]	Foreign share of sales[b]	Foreign share of employment[c]
Food and beverage	9.13	41.9	42.1
Grain mills and bakeries	0.92	67.5	55.2
Beverages	2.11	58.1	64.3
Other food	6.10	29.4	30.4
Tobacco	1.11	100.0	100.0
Rubber and plastics	2.01	83.6	80.2
Rubber	1.51	91.3	85.4
Plastic	0.50	62.4	62.1
Leather	0.04	39.1	22.4
Textiles	1.82	64.0	64.4
Knitting mills	0.01	66.6	58.1
Clothing industries	0.02	-	-
Wood	1.48	46.8	42.9
Furniture and fixtures	0.17	63.9	56.3
Paper and allied products	12.20	42.6	40.5
Printing and publishing	1.46	13.8	21.4
Primary metals	10.21	13.9	10.8
Fabricated metal	1.78	51.0	52.3
Machinery	1.69	95.5	89.5
Transportation equipment	33.20	93.3	82.0
Motor vehicles	29.57	98.1	94.5
Other transportation	3.63	56.0	62.8
Electrical products	3.38	59.7	61.8
Non-metallic mineral products	1.27	75.7	65.7
Stone, clay, and cement	0.46	62.7	51.8
Other	0.81	86.6	73.3
Petroleum and coal	10.00	69.3	80.6
Chemicals	8.07	76.9	76.4

Industry	1985-88	1988	
	Share of sales, by industry[a]	Foreign share of sales[b]	Foreign share of employment[c]
Industrial chemicals	5.25	76.5	78.1
Drugs	1.14	88.2	78.4
Soap, and cleaners	0.90	97.9	97.6
Other chemicals	0.78	37.0	41.0
Miscellaneous manufacturing	0.95	81.2	77.0
Scientific and professional equipment	0.76	93.7	93.0
Other miscellaneous	0.19	37.0	33.1
Total manufacturing	100.00	64.8	54.1

[a] Total shipments by each industry as a percentage of the total shipments made by this sample group of manufacturing establishments.
[b] Total shipments attributable to foreign-controlled establishments as a percentage of total shipments by each industry.
[c] Total employment attributable to foreign-controlled establishments as a percentage of total employment by each industry.
Source: Computations by the Economic Council of Canada and Investment Canada, based on data sample from Statistics Canada.

The first column of Table 3-1 shows the relative size of the two- and three-digit SIC industries included in the sample as measured by their share of total manufacturing sales. This enables the reader to assess the relative importance of the industries shown in the tables. Motor vehicles is by far the most important manufacturing industry in Canada, accounting for nearly 30 percent of the sample's sales. The paper and allied products, primary metals, and petroleum and coal industries each account for about 10 percent. Charts are used to illustrate the findings for total manufacturing and those four industries. A more detailed breakdown is provided in the tables. The leather, knitting mills, and clothing industries are not shown because of their insignificant size.

The incidence of foreign MNE presence across industries, measured by the percentage of sales and employment in each industry accounted for by foreign-controlled establishments in 1988, is also shown in Table 3-1. The tobacco industry was 100 percent foreign-controlled, making comparisons with domestic-controlled establishments impossible, so it has also been omitted from the tables that follow. Machinery, motor vehicles, and soap and cleaners have a very high foreign presence, so comparisons should be made with caution. The primary metal, printing and publishing, and paper and allied products industries have the lowest foreign presence. Note that foreign investment in publishing is subject to relatively more regulation than FDI in other manufacturing industries as the result of a general Canadian policy on cultural industries.

Labour-Productivity Differences

The Concept of Productivity

Productivity is a key indicator of economic performance, because it is the basis for long-run improvements in the standard of living. In this study, the concept of labour productivity rather than total factor productivity is used, as the latter requires capital stock data that are difficult to obtain and are often unreliable. Labour-productivity measures should be interpreted cautiously, however, as they are a function of two basic factors. The first is the amount of inputs, such as capital and energy, that are used along with labour in the production process. Other things being equal, a worker who uses a great deal of machinery will be more productive than a worker who does not. The second factor is the efficiency with which inputs are used in the production process. A plant that possesses superior technology or management skill, or is larger, is likely to have higher productivity.

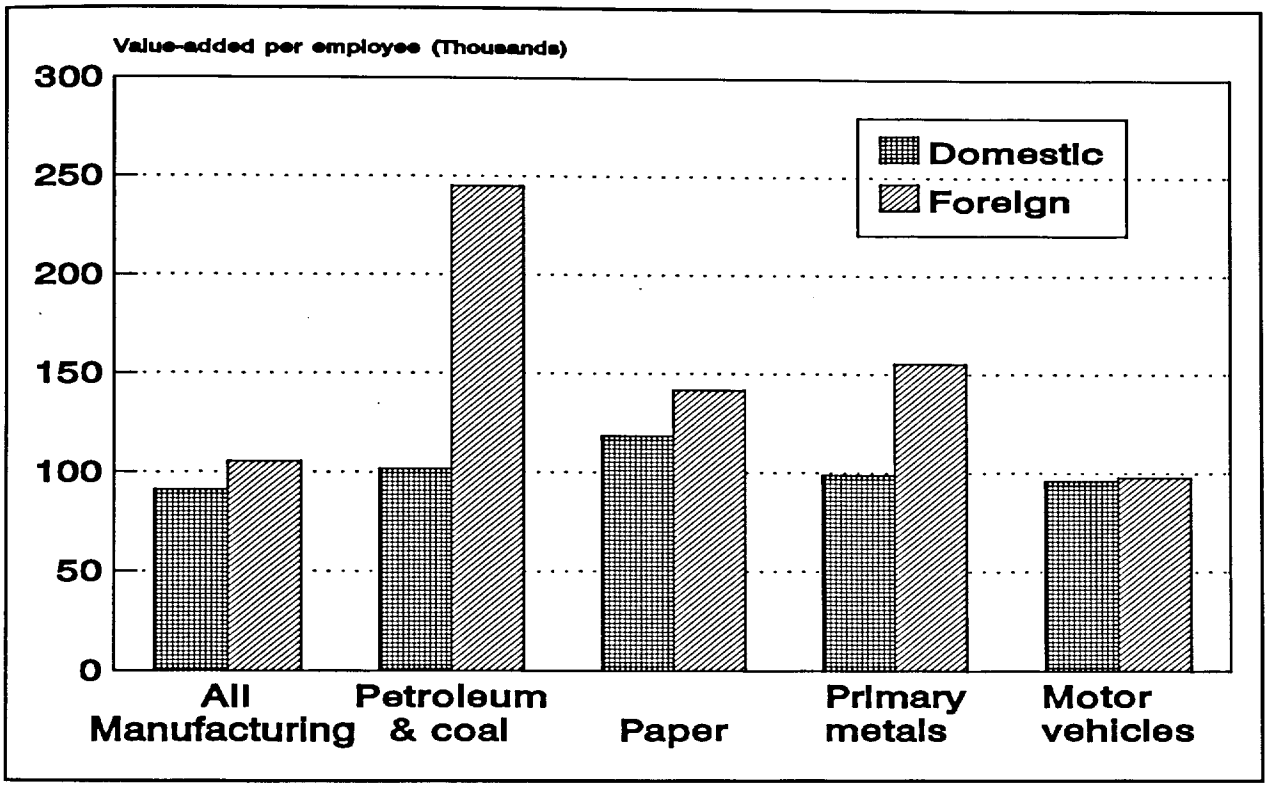
Of the two measures of labour productivity – value-added per employee and value-added per hour – the former is generally considered to be more reliable and is therefore referred to more frequently in this study. Value-added is defined as sales less the cost of material inputs. Manufacturing is used rather than total value-added, thereby eliminating the bias in favour of foreign firms that stems from the inclusion of goods for resale in total shipments.

Another bias in favour of foreign firms may stem from the fact that their head office services (located in the source country) are not included in total value-added but are required to support production activities in Canada; see Globerman (1979). Identical head-office services for domestic firms are located in Canada and may be included in the figures. Consequently, the operations of domestic plants that do not report manufacturing shipments are excluded. To the extent that head office facilities are physically separate from production facilities, the problem is minimized.

Transfer pricing – the price paid to the supplier of an input (the parent) by the final product divisions (the affiliates) – may also bias the productivity estimates for foreign MNEs. This pricing is likely to be influenced by differences in home- and host-country tax structures. If the MNE finds it profitable to shift reported earnings to the host country, it will deflate the price of inputs to foreign affiliates, leading to an overstatement of their value-added and their productivity. Mintz and Halpern (1991) report that effective corporate tax rates in Canada are higher than in the United States across a wide range of sectors. Therefore, any bias would most likely work in the opposite direction.[3]

[3] Transfer pricing occurs through intra-firm trade; so the greater the level of such trade, the more likely that a bias exists. See Chapter 4 for evidence on intra-firm trade.

Chart 3-1
Labour Productivity[a] of Domestic and Foreign Establishments, 1988



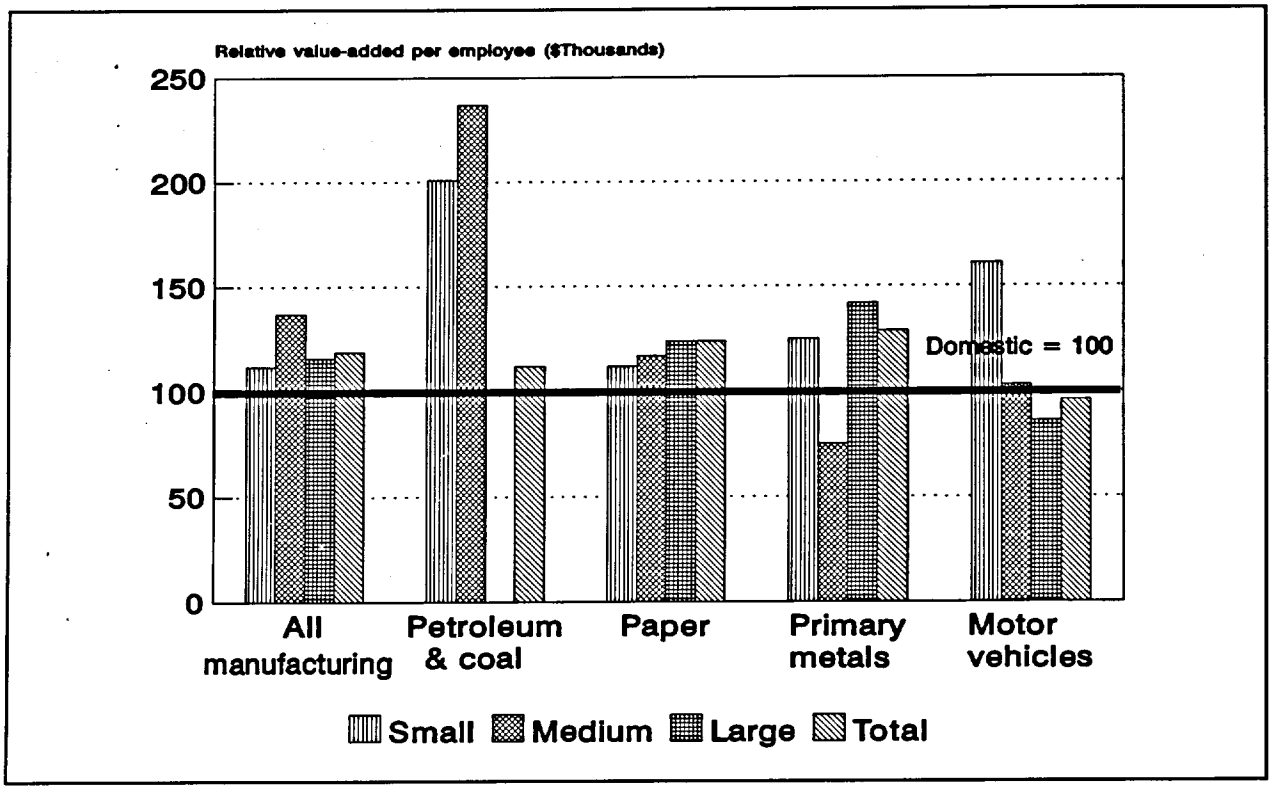
[a] Measured in current Canadian dollars

Source: Computations by the Economic Council of Canada and Investment Canada based on data from Statistics Canada.

An Initial Comparison

In the following section is a detailed statistical analysis of the productivity differences between foreign- and domestic-controlled establishments. It is helpful to begin with a few quick aggregate comparisons, however. Chart 3-1 illustrates the basic message of this chapter – that the productivity of foreign-controlled establishments is higher in the manufacturing sector as a whole and in most of the largest industries. Overall, value-added per employee was $105,562 for foreign firms and $91,091 for domestic firms in 1988 (in current Canadian dollars). These figures are comparable to those found in other studies that use disaggregated data, such as Alam et al. (1989). Of the four largest manufacturing industries shown in Chart 3-1, only in motor vehicles do the productivity differences between foreign and domestic firms appear to be small.

Chart 3-2
Relative Labour Productivity[a] of Foreign Establishments, by Size-Class, 1985-88



[a] Measured in current Canadian dollars
Source: Economic Council of Canada and Investment Canada based on data from Statistics Canada.

Chart 3-2 and Table 3-2 present more detailed evidence on the productivity gap. The table shows the ratio of foreign to domestic labour productivity over the entire 1985-88 period, by two- and three-digit SIC industry, broken down by small, medium, and large establishment-employment size-classes. Each size-class was defined as the lowest, middle, and highest third of the difference between the largest and the smallest establishment employment. Both relative value-added per employee and relative value-added per hour are shown. Chart 3-2 illustrates the basic results of Table 3-2 for manufacturing; petroleum and coal; paper and allied products; primary metals; and motor vehicles, and for each size-class within those industries.

Table 3-2
Relative Labour Productivity of Foreign Establishments, by Size-Class,[a] 1985-88

Industry	Small		Medium		Large		Total	
	Relative value-added[b] per:							
	Employee	Hour	Employee	Hour	Employee	Hour	Employee	Hour
Food and beverage	0.897	1.049	1.385	1.591	1.927	2.075	1.545	1.714
Grain mills and bakeries	1.078	0.914	2.335	2.598	1.464	1.021	1.642	1.391
Beverages	0.427	0.733	0.599	0.712	1.031	0.980	0.714	0.920
Other food	1.512	1.512	1.964	2.259	2.260	2.407	2.040	2.200
Rubber and plastics	1.439	1.413	1.608	1.705	1.518	1.56	1.385	1.278
Rubber	0.970	1.732	0.715	3.510	1.589	1.635	1.528	1.614
Plastics	1.630	1.412	1.744	1.228	1.154	1.010	1.607	1.240
Textiles	1.275	0.751	1.051	1.058	1.956	1.678	1.425	1.241
Wood	1.294	1.301	1.113	1.180	3.273	2.859	1.246	1.221
Fumiture and fixtures	-	-	0.715	0.931	1.492	1.583	1.201	1.171
Paper and allied products	1.307	1.085	1.168	1.228	1.242	1.286	1.236	1.274
Printing and publishing	1.057	1.283	0.864	0.591	0.619	0.432	0.682	0.499
Primary metals	1.246	1.446	0.746	0.912	1.424	1.399	1.285	1.308
Fabricated metals	0.970	1.058	1.442	1.487	1.101	1.245	1.175	1.305
Machinery	1.027	1.067	1.111	0.943	0.730	-	1.140	0.973
Transportation equipment	1.322	1.328	1.282	1.312	1.243	0.824	1.264	0.870
Motor vehicles	1.611	1.587	1.028	0.761	0.859	0.453	0.963	0.523
Other transportation	1.172	0.949	1.096	1.461	0.083	0.784	0.823	0.829
Electrical products	1.182	1.936	1.058	0.957	1.029	0.821	1.042	0.885
Non-metallic mineral products	1.200	1.181	1.321	1.534	0.999	0.876	1.489	1.481
Petroleum and coal	2.010	2.464	2.371	3.395	-	-	1.120	3.121
Chemicals	0.353	0.425	1.734	2.047	1.373	1.322	0.995	1.086
Industrial chemicals	0.247	0.281	1.161	0.773	1.439	1.049	0.745	0.639
Drugs	-	-	1.552	3.212	1.779	3.631	1.843	3.680
Soap, cleaners	1.826	3.309	-	-	-	-	1.710	2.623
Other chemicals	1.298	1.380	3.383	4.725	0.208	0.175	1.471	1.951
Miscellaneous manufacturing	1.511	1.328	0.637	0.477	0.492	0.478	0.813	1.173
Scientific and professional equipment	2.055	2.419	0.334	0.048	0.492	0.478	0.475	0.342
Other miscellaneous	1.280	1.023	0.837	0.533	-	-	0.932	0.609
Total manufacturing	1.120	1.197	1.370	1.544	1.159	1.064	1.190	1.143

[a] Small, medium and large size-classes are defined as the lowest, middle, and highest third, respectively, of the difference between the employment of the largest and the smallest establishment.

[b] Manufacturing value-added per employee (per hour) in foreign-controlled establishments divided by that in domestic-controlled establishments. The ratios indicate the relative size of the productivity differential. For example, a ratio of 1.20 means that the foreign-controlled establishments are 20% more productive than the domestic ones, while a ratio of 0.89 indicates that their productivity is only 89% of that of domestic firms.

Source: Computations by the Economic Council of Canada and Investment Canada based on data from Statistics Canada.

Overall, there is no simple relationship between size and the productivity advantage of foreign firms, as this advantage is greatest in the medium size-class. While foreign MNEs have a value-added-per-employee advantage of 19 percent for the total of all manufacturing, the advantage is 37 percent in the medium size-class. Thus the factors that explain the productivity advantage of foreign plants do not seem to be conditioned by differences in size.

Even within the same industry, the foreign plants tend to be more productive. A few industries are exceptions to that pattern, however. In beverages, printing and publishing, industrial chemicals, and scientific and professional equipment, domestic-controlled establishments were more productive.[4]

The industries where foreign MNEs have the largest value-added-per-employee advantage are food and beverages, drugs, soaps and cleaners, and plastics. Foreign MNEs also have a very large value-added-per-hour advantage in petroleum and coal. Note that the level of aggregation at which the comparison is made can be quite important in some cases. For example, although domestic firms have a productivity advantage in both motor vehicles and other transportation equipment, the fact that foreign plants dominate the higher value-added-per-employee motor vehicles industry gives them an advantage at the level of transportation equipment as a whole. As pointed out above, however, the basic results are usually the same, regardless of the level of aggregation.

The fact that the productivity of foreign MNEs in Canada is higher than that of similar domestic-controlled firms raises the question of how the productivity of those MNEs compares with that of establishments in the source country. Several studies that made comparisons between Canadian and U.S. productivity found that Canadian manufacturing industries lag significantly behind their U.S. counterparts.[5] The ideal way to answer this question would be to calculate the productivity of the establishments of horizontal MNEs with operations in both Canada and the source country. Unfortunately, such data are not available. The size of the productivity gap between Canada and the United States seems to be even larger, however, than the one between U.S. affiliates and domestic-controlled firms in Canada.[6]

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[4] In addition, if value-added per hour is used instead of value-added per employee, domestic firms were more productive in transportation equipment and electrical products.

[5] This lag is between 20 percent and 50 percent, depending on the time period and the type of analysis used; see Rao and Lemprière (1990) and Bernhardt (1980).

[6] Rao and Lempriere (1990) found that in 1985, value-added per hour was 23.4 percent higher in U.S. manufacturing. In our sample of Canadian manufacturing, the productivity of U.S. firms in 1985 was 14 percent greater than that of domestic firms, suggesting that the former are less productive in Canada than in the United States, despite having access to the same technology and management.

An Analysis of Productivity

The evidence presented above shows that foreign MNEs in Canada have higher labour productivity than domestic manufacturing firms across a broad spectrum of industries and within comparable size-classes. This advantage may be attributable to a greater use of other factor inputs, to superior technology (emphasized in the industrial-organization theory of MNEs), to government policies, or to a combination of all three. Given that sound policy cannot be made without an understanding of the relative importance of each factor, an attempt is now made to quantify their influence. After a discussion of how these determinants of productivity can be measured, the authors present and estimate some models. The first of these uses the entire data sample and controls for establishment ownership using dummy variables. The second model attempts to explain the productivity gap between foreign and domestic firms using matched pairs of establishments.

Determinants of Productivity

Scale Economies (SCALE)

Increased plant- and/or product-specific scale economies should be positively related to productivity for two reasons. First, there are the benefits of increased specialization and of spreading out fixed costs. Second, the learning-by-doing associated with long production runs also enhances productivity.

In order to capture the effects of scale economies, the variable *SCALE* is defined as the ratio of average establishment employment in an industry to the average establishment employment within the largest size-class of that industry.[7] As already explained, size-classes are defined by dividing the difference between the largest and the smallest establishments into thirds. Baldwin and Gorecki (1986) argue that the ratio of plant size in Canada relative to the largest plants in the United States is a better proxy. Unfortunately, no comparable U.S. data were available, so *SCALE* may not capture the true minimum efficient scale.

Factor Proportions (LK, EN1, EN2)

Since capital and labour are often substitute inputs in production, the greater the capital intensity in an industry, the higher the labour productivity. Energy and labour are also substitutes, so an increase in the energy/labour ratio is also positively related to labour productivity.

Two proxies are used for different factor proportions. The first, *LK*, defines labour intensity as wages and salaries divided by value-added minus wages and salaries. The second, *EN1*, defines energy intensity as the ratio of the total cost of heat and power to total wages

[7] Average shipments were also used in the analysis.

and salaries. An alternative definition, (*EN2*), is the ratio of the total cost of heat and power to the total cost of production materials.

EXPLANATORY VARIABLES USED IN THE PRODUCTIVITY MODELS

SCALE	*Scale economies* – Average establishment employment in industry / average establishment employment in the largest size-class in industry
LK	*Labour intensity* – Wages and salaries / (manufacturing value-added minus wages and salaries)
EN1	*Energy intensity* – Cost of heat and power / wages and salaries
EN2	*Energy intensity* – Cost of heat and power / cost of production materials
LQ1	*Labour Quality* – Salaried workers / total employment
LQ2	*Labour Quality* – Non-production workers / total employment
R&D	*R&D intensity* – R&D expenditures in industry / total shipments in industry
HT	*High-technology variable* – Dummy variable for high-technology industry, as defined by OECD
TARIFF	*Trade barriers* – Nominal tariff and non-tariff protection in industry in 1987
CR4	*Market structure* – Proportion of sales accounted for by the four largest firms in industry
TARCON4	*Market structure* – Dummy variable for industries with both *TARIFF* and *CR4* greater than mean.
FD	*Ownership variable* – Dummy variable for foreign-controlled establishment
FS	*Foreign-presence variable* – Shipments attributable to foreign-controlled establishments / Total shipments in industry

Labour Quality (LQ)

Just as labour productivity should increase with the amount of physical capital used in production, so too should it increase with the amount of human capital. Ideally, labour quality would be measured by skill requirements for the various industry activities. Data are unavailable, however, so labour quality is proxied by *LQ*, the ratio of salaried workers to total employment. Strictly speaking, this is the input of white-collar workers rather than labour quality.

Research and Development (R&D, HT)

The positive impact of research and development on labour productivity is generally attributed to two types of effects: the direct effect of the introduction of innovations on the efficiency of the production process and the indirect effect of positive externalities. Research and development intensity (*R&D*) is defined here as the ratio of research and development expenditures to total shipments by industry. A dummy variable (*HT*) is also created to represent a high-technology industry, as defined in OECD (1986).

Trade Barriers (TARIFF)

As discussed in the preceding chapter, the Eastman-Stykolt hypothesis suggests that the more protected an industry is from international competition, the greater the production inefficiency and hence the lower the labour productivity. The variable *TARIFF* captures the degree of nominal tariff and non-tariff protection in each industry in 1987. This is the most recent estimate of trade protection, and it is assumed that trade barriers in 1985, 1986, and 1988 were the same as in 1987.

Market Structure (CR4, TARCON4)

A prominent strand of the industrial-organization literature – the so-called structure-conduct-performance paradigm – argues that a given market structure in an industry leads to a certain conduct by firms and thereby determines overall performance. For example, firms in highly concentrated industries may face less pressure to reduce costs and introduce innovations; their labour productivity would therefore be lower. Critics of the structure-conduct-performance paradigm claim that the causation is likely to be the opposite. The most efficient firms in an industry (i.e., those with the highest labour productivity) will be able to capture larger market shares. This superior performance will lead to higher measures of industry concentration. We measure concentration by the index *CR4*, the level of sales accounted for by the four largest companies in a given industry.

To investigate the interaction between trade barriers and concentration, a binary variable, *TARCON4*, was created. It is set equal to 1 if the tariff rate in an industry is greater than the mean tariff across all industries and if the concentration ratio in an industry is greater

than the mean concentration ratio across all industries; see Saunders (1982) and Baldwin and Gorecki (1986).

Models of Productivity (*LP*)

Estimating the Importance of Each Determinant of Productivity (*LP*)

In order to determine the impact of each of the factors listed above on labour productivity, one must begin with a properly specified model. However, the authors adopt the standard approach – e.g., Blomström (1989) – which is to assume a production function that relates output to inputs. A logarithmic transformation[8] then allows us to run the following linear regression of labour productivity onto its determinants:

$$LP = f(LK,\ EN,\ LQ,\ SCALE,\ R\&D,\ HT,\ TARIFF,\ CR4,\ TARCON4),$$

where *LP* is value-added per employee, and the other variables are defined above. The log-linear functional form implies that the coefficients of the right-hand-side variables are elasticities.

The model used annual data for 1985 to 1988 on individual foreign- and domestic-controlled establishments that were aggregated to the three-digit SIC level in order to maintain a large number of observations. A pooled cross-section, time-series analysis at the plant level would have required the elimination of all births and deaths, as well as all plants that were not surveyed during one of the four years. Furthermore, several of the explanatory variables are only defined at the industry level.

The model was first estimated using a sample of both foreign- and domestic-controlled establishments, and then the analysis was repeated using samples of only foreign and only domestic establishments in order to see if some variables influence foreign firms differently. The authors' explanation of the productivity gap between foreign and domestic firms uses the more restrictive model below, however. (For a discussion of the results using the samples of only foreign and only domestic establishments, see Appendix B.)

The total sample contains 392 observations comprising 160 observations (40 industries times 4 years) from the domestic sample and 232 observations (58 industries times 4 years) from the foreign sample. The difference between the foreign and the domestic sample reflects the absence of domestic and foreign firms in certain industries. In addition, the number of observations was fixed by the constraint that data be available for each variable. The results

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[8] To illustrate how the regression equation is derived, consider a simple Cobb-Douglas production function $Q = AK^{a}L^{1-a}$, where A is the level of technology. Labour productivity is thus $Q/L = A(K/L)^{a}$, where K/L is the capital-labour ratio. Taking logs gives us: $ln(Q/L) = ln(A) + aln(K/L)$, wherein (A) represents a factor other than (K/L).

of several versions of the model are shown in Table 3-3. The different equations illustrate their robustness following slight changes and indicate that multicollinearity is not a problem.

Note that the explanatory variables have coefficients with the expected sign. The *SCALE* variable was positively related to labour productivity but was not statistically significant in any equation. Along with the size of the elasticity (approximately 1 percent), this finding suggests that an increase in scale has surprisingly little impact (if any) on labour productivity. That could be due to the fact that even the largest size-class of firms in the sample does not capture the "true" minimum efficient scale. It could also be attributed to the sample selection process, since the average establishment size in the sample (approximately 600 employees) is much larger than the average size using the universe of manufacturing plants.

Labour quality was strongly related to labour productivity (statistically significant at the 1 percent level) and positive in all the equations. Since labour quality is measured as the proportion of workers who are white-collar, which serves as a proxy for a higher-educated workforce, then it follows that the more educated the workers are, other things remaining equal, the higher the productivity.

The factor-intensity variables, *LK* and *EN2*, were also strongly related to labour productivity. (Regressions with *EN1* were estimated but are not shown, however, since the results were similar.) While an increase in the *LK* ratio by 100 percent leads, however, to a 45 percent decrease in productivity, a similar increase in energy intensity (*EN2*) increases productivity by only 7.5 percent (Table 3-3). The different impact on labour productivity of the factor-intensity variables is a reflection of the importance of the respective inputs in production. On average, wages and salaries as a proportion of total value-added are approximately 38 percent, whereas the cost of energy as a proportion of value-added is only 4 percent, on average. The estimated elasticities are consistent with a Cobb-Douglas production function for which elasticities are equal to factor shares.

The *HT* variable, representing sectors that are considered "high-technology", was not statistically significant but did display the expected (positive) sign. While there does not appear, however, to be a strong relationship between labour productivity and the high-technology characteristics of an establishment's sector, there is such a relationship with respect to R&D intensity. This variable was positive and statistically significant at the 1 percent level. The *R&D* variable could not be extracted from plant (or firm) level information; thus industry R&D data were employed. Given that only a few firms in an industry may be performing R&D, the strong positive effect of this variable on labour productivity in the entire industry may partly capture positive spillovers from their expenditures. This issue will be examined more closely in the next section.

Table 3-3
Determinants-of-Productivity Model: Total Sample

Dependent variable: Value-added per employee			
Equation	(1)	(2)	(3)
Constant	11.698*** (119.6)	11.707*** (121.7)	11.57*** (118.4)
LK	-0.464*** (-17.8)	-0.462*** (-18.1)	-0.446*** (-31.01)
SCALE	0.014 (0.67)	0.014 (0.72)	0.003 (0.17)
LQ1	0.070*** (2.74)		
LQ2		0.096*** (4.02)	0.100*** (4.59)
EN2	0.075*** (5.62)	0.073*** (5.65)	0.068*** (4.73)
TARIFF	-0.019 (-1.46)	-0.019 (-1.49)	-0.003 (-0.18)
R&D	0.082*** (4.461)	0.074*** (4.04)	0.070*** (4.37)
HT			0.002 (0.03)
CR4	0.115* (1.88)	0.124** (2.04)	0.224*** (2.98)
TARCON4			-0.086** (-2.48)
FD			0.114*** (5.08)
ADJ.R-SQ.	0.76	0.76	0.78
SSE	24	23.4	21.6
N	392	392	392

*** Statistically significant at the 1% level
** Statistically significant at the 5% level
* Statistically significant at the 10% level
Note: Figures in brackets are the respective *t*-statistics.

The *TARIFF* variable was negatively related to labour productivity, as the Eastman-Stykolt hypothesis would lead one to expect. It was not statistically significant, however, so the Eastman-Stykolt effect does not seem to be an important determinant of productivity for the total sample. Tables B-1 and B-2 in Apppendix B indicate that this is due to foreign and domestic firms behaving differently from one another. *TARIFF* is insignificant in the foreign sample but highly significant in the domestic one. The influence of trade barriers on the productivity gap between foreign and domestic firms is examined in more detail in Appendix C.

CR4 represents the market-structure variable measuring concentration and is found to be positively related to labour productivity and statistically significant at varying levels. The strength of this relationship runs counter to the structure-conduct-performance paradigm, which predicts that the more concentrated an industry, the more likely are its production methods to be inefficient. The correct interpretation of the observed relationship is likely to be that the high market shares of the leading firms in an industry stem from their higher productivity. When trade protection is combined with high concentration, however, the opposite is true. *TARCON4* was negatively related to labour productivity (significant at the 5 percent level), implying that the more protected and the more concentrated the industry becomes, the less productive it becomes. This adds further support to the Eastman-Stykolt hypothesis. Note that the concentration variables are potentially collinear to the *SCALE* variable. The authors therefore estimated the equations without *CR4*. The results are not reported here, but there was no qualitative change.

The regression results indicate that these variables explain a substantial amount of the variation in productivity across Canadian manufacturing. Many of the intangible factors that economic theory points to as giving MNEs an advantage are not, however, included in the regressions. An attempt was made to capture their influence in an indirect way by including an ownership dummy variable, *FD*, in the last equation. That enabled the authors to determine whether foreign-controlled establishments were still more productive than domestic-controlled firms after accounting for all the tangible factors mentioned above. The *FD* variable was positive and statistically significant at the 1 percent level, suggesting that foreign MNEs are about 11 percent more productive than domestic-controlled firms. The ability of foreign subsidiaries to draw on the superior technology of their parents appears to be an important explanation of the productivity gap.

In order to determine whether differences in ownership across countries influence productivity, the foreign-ownership dummy variable was disaggregated into U.S., U.K., Other Western Europe, and Pacific Rim (including Japan), and the analysis was then repeated. With the exception of Other Western Europe, which was statistically insignificant and negative, the foreign-ownership variables were positively related to labour productivity and were significant. This finding is interesting because cross-country comparisons of manufacturing productivity reveal that the United Kingdom and the Pacific Rim countries are less productive than Canada. The Canadian affiliates of these countries' MNEs therefore appear to be more productive than the typical establishment in the home country.

Explaining the Productivity Gap

In order to better understand how foreign firms compare with domestic firms, the authors matched pairs at the four-digit SIC[9] level and used the ratio of foreign to domestic productivity – the productivity gap – as a dependent variable. As shown in Appendix C, however, only trade barriers and energy intensity proved to be statistically significant explanations of the productivity gap.

Multinationals and Technology Spillovers

The effect of FDI on technological change is one of the most controversial issues in the debate over MNEs. On the one hand, the transfer of foreign technology, which can take the form of positive spillovers to domestic firms, is one of the most frequently cited host-country benefits of FDI. On the other hand, opponents of FDI have often cited the loss of spillovers from the R&D of acquired firms, because of centralization of such activities at the head office, as a major cost of FDI; see, e.g., Britton and Gilmour (1978).

Empirical studies of Canadian manufacturing have found a high positive correlation between the research-and-development intensity of an industry and its level of foreign ownership; see, e.g., Saunders (1982). Furthermore, recent evidence does not support fears of a "headquarters" effect associated with foreign acquisitions of Canadian high-technology firms. Using data from tax returns, Regional Data Corporation (1992) found that the R&D intensity of Canadian manufacturing firms acquired by foreigners was not only far above average, but actually increased after the acquisition. This finding is consistent with the theories of Cantwell (1991), who argues that modern MNEs will locate R&D activities across many different countries in order to take advantage of differing technological competencies.

Quantifying the extent of technological spillovers is an extremely difficult task involving the use of highly sophisticated econometric methods and data that are difficult to obtain. The studies surveyed by Bernstein (1991) convincingly show, however, that the social returns to R&D exceed the private returns in several manufacturing industries. Many of these "strategic" industries have a large degree of foreign control, indicating that some foreign affiliates in Canadian manufacturing bring spillover benefits associated with their high level of R&D.

Although the database used here does not include firm-level R&D expenditures, it is possible to investigate the potential for intra-industry spillover effects by estimating the following statistical model using the domestic-establishments sample:

$$LP = H(SCALE, LQ, EN, LK, R\&D, TARIFF, HT, FS),$$

[9] Given the low level of aggregation (four-digit SIC) and the large number of industries (31), the inclusion of industry dummy variables was not considered worthwhile.

where domestic productivity is a function of the variables described above, in addition to a foreign-presence variable, *FS*. The *FS* variable was constructed as the total shipments in an industry accounted for by foreign-controlled firms (see Table 3-1).[10]

This simple model is similar to those used by Globerman (1979) and Blomström (1990) to test for intra-industry spillover effects. These effects are much broader than those considered in studies of R&D-expenditure-related spillovers. They include anything that might cause the productivity of domestic firms to change with the size of foreign firms in the industry. There are, however, some problems with this widely accepted methodology. For example, the *FS* variable may be highly correlated with another variable that has a positive impact on productivity but is not included in the model. Nonetheless, the methodology may shed some light on the issue of potential spillover benefits of FDI.

The regression results using a logarithmic specification are reported in Appendix B, Table B-1, equation (5). The number of observations for this model was 160, comprising 40 industries times 4 years. The *FS* variable is negative and insignificant. The sign of this variable is, however, highly sensitive to the functional form employed in estimating the regression. With a linear specification (not reported here), the *FS* variable has a positive sign, although it is still insignificant. Nor does multicollinearity seem to account for the insignificance of *FS*. Dropping some of the explanatory variables did not qualitatively change the results. The sensitivity of these regressions to the specification of the functional form contrasts with the robustness of those reported earlier and implies that drawing conclusions from this type of model is extremely difficult.

There are plausible theoretical rationales for the negative sign of the *FS* variable. Foreign firms may find it easier to enter markets in which domestic firms are unproductive. Alternatively, the presence of foreign firms may have a "strategic" effect that deters innovative efforts by domestic firms or prevents them from reaching an efficient scale. Veugelers and Vanden Houte (1990) provide a model of such strategic R&D competition and argue that this effect led Belgian manufacturers to reduce R&D intensity. It is impossible, however, to support either of those two hypotheses, let alone the positive-spillovers hypothesis, with the data available on Canadian manufacturing.

[10] Two alternative measures constructed and tested were the total number of employees and the total value-added in an industry accounted for by foreign firms.

Results Related to Productivity Performance

Labour productivity is an important element of economic performance, but some related aspects of this issue also deserve attention. For example, how does the productivity advantage of foreign MNEs affect workers' wages? Are foreign branch-plants simply distribution outlets for MNEs?

Wages and Salaries

The higher labour intensity of domestic-controlled manufacturing establishments is one of the reasons that their labour productivity is usually lower than that of foreign establishments. Table 3-4, which shows the relative share of wages in value-added, reveals that all of the industries in which domestic establishments have a large labour-productivity advantage (see Table 3-2) also have lower labour intensity. The share of wages in value-added in manufacturing is smaller for foreign than it is for domestic firms. The absolute size of value-added, howewver, is larger for foreign than for domestic firms. These two effects cancel each other out at the level of aggregate manufacturing, so that there is no difference in wages and salaries per hour regardless of the country of control.

The higher productivity of foreign-controlled establishments does not lead to higher labour incomes, but it may confer other benefits. Canadian investors are likely to receive some of the remainder of the larger value-added pie (i.e., the return on capital and the pure economic profits). That may occur directly for minority shareholders or indirectly through the higher acquisition prices paid by foreigners for domestic firms.

Nonetheless, the fact that the higher productivity of foreign-controlled firms does not lead to proportionally higher wages and salaries may have important consequences for policy. First, governments may be concerned about the distribution of the benefits of higher productivity. Second, the fact that foreign firms with relatively high productivity are paying comparable wages and salaries is a sign that those firms might be earning rents. There is always a possibility that strategic policies could shift such rents to Canadian investors.

The equality of labour compensation at the level of total manufacturing masks some significant differences among industries. As can be seen in Table 3-4, in industries where foreign firms have the largest value-added-per-hour advantages (petroleum and coal; drugs; soap and cleaners; and food), the labour they employ receives higher compensation. Similarly, the gap between the wages and salaries of domestic-firm and foreign-firm employees is greatest where domestic establishments have higher value-added per hour (printing and publishing; scientific and professional equipment; motor vehicles; and electrical products).

Table 3-4
Relative Labour Intensity, Compensation and Production Measures of Foreign Establishments[a], 1985-88

Industry	Relative share of wages and salaries in value-added	Relative wages and salaries per hour	Relative share of salaries in total wages and salaries	Relative share of production workers in employment
Food and beverages	0.689	1.331	1.225	0.903
Grain mills and bakeries	0.917	1.043	0.659	1.159
Beverages	1.180	1.296	1.307	0.860
Other food	0.517	1.257	1.271	0.919
Rubber and plastics	1.054	1.226	0.817	0.999
Rubber	1.086	1.599	0.816	0.971
Plastics	0.680	0.803	0.910	1.047
Textiles	0.959	1.173	0.958	0.982
Wood	0.904	1.124	1.088	1.003
Furniture and fixtures	0.978	1.215	1.157	0.959
Paper and allied products	0.805	1.077	1.170	0.966
Printing and publishing	1.095	0.490	0.886	1.203
Primary metals	0.755	0.982	0.986	0.990
Fabricated metal	0.831	1.148	1.147	0.978
Machinery	0.676	0.818	1.491	0.858
Transportation equipment	1.177	0.823	0.625	1.223
Motor vehicles	1.398	0.681	0.755	1.056
Other transportation	1.261	1.099	1.065	0.981
Electrical products	0.920	0.725	0.802	1.120
Non-metallic mineral products	0.768	1.122	0.954	0.997
Petroleum and coal	0.361	2.964	2.567	0.386
Chemicals	1.017	1.152	1.062	0.920
Industrial chemicals	1.617	0.892	0.766	1.137
Drugs	0.339	2.379	1.695	0.563
Soap, cleaners	0.560	2.372	3.978	0.654
Other chemicals	0.462	1.281	1.453	0.724
Miscellaneous manufacturing	1.080	1.418	1.148	0.807
Scientific and professional equipment	3.745	0.610	0.741	1.570
Other miscellaneous	1.297	0.635	0.480	1.180
Total manufacturing	0.859	1.000	1.042	0.986

[a] Foreign-controlled establishment measure divided by domestic-controlled establishment measure.
Source: Computations by the Economic Council of Canada and Investment Canada, based on data from Statistics Canada.

The "Assembly-Plant" Criticism

A frequent criticism of foreign multinationals is that they only carry out final assembly and distribution in the host country, leaving most of their production to the home country. It is possible to evaluate this criticism directly using the two measures reported in Table 3-4 – namely, foreign-to-domestic ratios for the salary proportion of wages and salaries and the production workers' share of total employment throughout the period 1985-88. At the level of total manufacturing, there is little difference between foreign and domestic firms. While MNEs usually have a smaller proportion of their workforce engaged in production than do Canadian firms (with the exception of beverages; petroleum and coal; machinery; and most chemical industries), the difference is less than 10 percent. As one would expect, the reverse pattern holds for the share of salaries in labour compensation. It has been concluded that the claims that foreign plants are merely centres for final assembly and distribution lack validity.

CHAPTER 4
Multinationals and International Trade

MULTINATIONALS AND INTERNATIONAL TRADE

The role of MNEs in shaping Canada's international trade performance is the second aspect of competitiveness examined in this paper. In Canada, there has been much controversy over whether MNEs are mere "tariff factories" that exist to service the local market or whether they are competitive exporters in their own right. The Canada-U.S. Free Trade Agreement has helped to revive that debate with its inherent fear of "footloose" production leaving Canada. Given that a number of studies have, however, evaluated the impact of trade liberalization on MNEs – e.g., McFetridge (1989), and Rugman (1990) – this paper will deal mainly with the more general issues of trade performance.

For the reasons discussed in Chapter 2, the effects of FDI on the pattern and level of trade, rather than on the trade balance, constitute the appropriate definition of trade performance. The theory of the multinational enterprise shows that there is usually no simple relationship of substitution or complementarity between trade and FDI; so the question of the impact of MNEs on the level and pattern of trade is essentially empirical. The authors of this paper attempt to answer this question in three parts. First, a comparison is made between the outward orientation of domestic firms and foreign MNEs, as measured by relative export and import propensities. Next, the relationship between foreign MNEs, comparative advantage, and intra-industry trade patterns is discussed. Finally, evidence is presented on intra-firm trade, and the internalization theory is discussed.

Export and Import Propensities

Exports

The Sample

In this comparative analysis of export performance the same sample of manufacturing establishments is used as in Chapter 3 (see Appendix A for details). Only 1987 data were available, however, and given that the sample is based on larger-than-average establishments (those with capital expenditures), the sample accounts for a larger proportion of total manufacturing exports (49.7 percent) than of sales (39 percent).

Table 4-1 shows the shares of selected manufacturing industries in the total exports of the sample. Transportation equipment accounts for over half of manufacturing exports, and motor vehicles alone account for 47.4 percent. The other key export industry is paper and allied products. The furniture and fixtures, as well as printing and publishing, industries have only a negligible amount of exports, so they are omitted from subsequent tables.

Table 4-1
Share of Manufacturing Exports, by Industry and Proportion of Industry Exports Attributable to Foreign Establishments in Canada, 1987

Industry	Industry share of total manufacturing exports (%)	Foreign share of each industry's exports (%)
Food and beverages	1.82	29.70
Rubber and plastics	0.94	72.75
Textiles	1.33	90.51
Wood	3.08	61.96
Furniture and fixtures	0.09	37.70
Paper and allied products	22.12	48.91
Printing and publishing	0.05	76.65
Primary metals	3.71	11.87
Fabricated metal	1.37	52.16
Machinery	3.24	99.70
Transportation equipment	53.33	93.47
Motor vehicles	47.44	95.70
Other transportation	5.89	75.50
Electrical products	2.67	80.15
Non-metallic mineral products	0.33	38.31
Petroleum and coal	2.00	77.83
Chemicals	3.26	46.93
Miscellaneous manufacturing	0.62	82.09
Total manufacturing	100.00	75.35

Source: Computations by the Economic Council of Canada and Investment Canada based on data from Statistics Canada.

Also shown in Table 4-1 is the share of each industry's exports attributable to MNEs. Approximately three-quarters of the manufacturing exports in our sample are attributable to foreign MNEs – a result that is highly consistent with the findings of other studies. For example, Alam et al. (1989), using the entire Census of Manufacturing, report that the MNE share of Canadian manufacturing exports was 80.2 percent in 1984. The industry breakdown shows that the prominence of MNEs in manufacturing trade relates both to their concentration in a few industries with a disproportionate amount of exports, such as motor vehicles, and to the fact that they account for the majority of exports from most of the industries in manufacturing.

Export Propensities

Although MNEs account for a very large fraction of Canada's trade, they also account for a large fraction of manufacturing sales. An appropriate comparison of the outward orientation of domestic and foreign firms must therefore examine relative export propensities (exports as a proportion of total sales). Table 4-2 reports the export propensities of foreign and domestic firms, as well as the ratio of the two, by industry. For manufacturing as a whole, the export propensity of foreign MNEs is 73 percent higher than that of domestic-controlled firms, thereby contradicting claims that MNEs exist only to service the Canadian market. Although the tariff may have been important in inducing foreign firms to establish operations in Canada, their affiliates seem to have become competitive exporters in their own right.

The breakdown of relative export propensities by industry reveals that part of the greater overall outward orientation of foreign MNEs is attributable to the fact that they dominate sales in the export-oriented motor vehicles industry. Their export propensity there is actually inferior to that of the less numerous domestic-controlled establishments in that industry. Nonetheless, the greater overall outward orientation of MNEs cannot be attributed to the motor vehicles industry alone, as their export propensity is higher than that of domestic plants in nine of the 14 industries listed in Table 4-2. The machinery industry, in particular, stands out as being sharply divided between domestic firms which account for only a small fraction of sales and sell almost all their products in Canada, and foreign firms; the latter sell over 80 percent of their goods abroad.

A wide variety of factors may explain the generally greater propensity to export of foreign MNEs relative to domestic firms within a given industry. For example, foreign subsidiaries may be drawing on their parents' greater knowledge of the export market or may be exploiting their brand loyalty. They may also be circumventing entry barriers that deter domestic firms in oligopolistic industries. It is impossible to discern these hypotheses here.

Table 4-2
Export Propensities of Foreign and Domestic Establishments, by Industry, 1987

Industry	Exports as a proportion of total shipments		
	Foreign (%)	Domestic (%)	Foreign/domestic ratio
Food and beverages	4.42	9.77	0.45
Rubber and plastics	16.61	21.19	0.78
Textiles	36.43	7.74	4.71
Wood	58.81	42.39	1.39
Paper and allied products	66.70	48.92	1.36
Primary metals	9.88	11.39	0.87
Fabricated metal	25.73	21.42	1.20
Machinery	83.02	2.37	35.03
Transportation equipment	56.00	51.20	1.09
Motor vehicles	55.56	62.88	0.88
Other transportation	60.85	42.28	1.44
Electrical products	33.14	17.02	1.95
Non-metallic mineral products	7.06	8.60	0.82
Petroleum and coal	7.58	3.43	2.21
Chemicals	9.19	34.70	0.27
Miscellaneous manufacturing	24.89	15.06	1.65
Total manufacturing	39.50	22.83	1.73

Source: Computations by the Economic Council of Canada and Investment Canada based on data from Statistics Canada.

Imports

The Sample

Import data are available for each year between 1985 and 1988 but are only available at the level of the *company* instead of the establishment (see Appendix A). Thus the sample overstates the actual value of imports per plant, as some of the companies examined control establishments that are not counted in the Census of Manufacturing or the Capital Expenditures Survey.

Table 4-3 shows the share of the sample's imports and the percentage of each industry's imports attributable to foreign MNEs from 1985 to 1988. The motor vehicle industry, which is the largest manufacturing exporter, is also by far the largest importer. In our sample, 45 percent of all manufacturing imports were in motor vehicles; Mersereau (1991) found 52 percent in 1986. The other major importing industry is primary metals. Note that while the motor vehicle industry is simultaneously a major exporter and importer, the paper industry is only a major exporter.

Foreign MNEs account for about 88 percent of manufacturing imports, which is slightly higher than most other estimates that are based on broader samples with more small establishments. For example, Alam et al. (1989) claim that 80 percent of manufacturing imports and 64 percent of the imports to all sectors in 1984 were attributable to foreign MNEs. Mersereau (1991) finds similar results for 1986. In machinery, motor vehicles, and non-metallic mineral products, domestic firms account for only an insignificant fraction of all imports. Furthermore, foreign MNEs account for the majority of imports in all but the wood and the paper and allied products industries.

Import Propensities

With respect to the manufacturing sector, import propensities are defined as total imports of intermediate goods divided by total production. Given that the company-level import figures include finished goods, the calculated value of import propensities is strongly biased upwards and even exceeds 100 for most industries. (The results from the sample can be seen in Table A-1, Appendix A.) The upward biases should, however, partially cancel out when the ratio of foreign to domestic firms is taken. Such a comparison reveals that foreign firms have a propensity to import that is about five times greater than that of domestic firms. Printing and publishing, primary metals, and non-metallic minerals are the industries where these differences are the greatest. Domestic companies have a slightly higher import propensity in the wood; paper and allied products; fabricated metals; and petroleum and coal industries.

Table 4-3
Share of Manufacturing Imports, by Industry, and Proportion of Industry Imports Attributable to Foreign Establishments in Canada, 1985-88

Industry	Industry share of total manufacturing imports (%)	Foreign share of each industry's imports (%)
Food and beverages	2.12	62.26
Rubber and plastics	2.20	89.45
Textiles	5.68	93.73
Wood	0.35	41.92
Furniture and fixtures	0.10	70.91
Paper and allied products	1.22	40.10
Printing and publishing	1.32	80.72
Primary metals	10.84	68.48
Fabricated metal	1.56	58.87
Machinery	6.81	97.70
Transportation equipment	50.82	95.91
Motor vehicles	44.85	97.11
Other transportation	4.23	86.88
Electrical products	2.97	70.79
Non-metallic mineral products	3.24	96.23
Petroleum and coal	2.97	79.16
Chemicals	5.20	86.63
Miscellaneous manufacturing	1.13	80.07
Total manufacturing	100.00	88.30

Source: Computations by the Economic Council of Canada and Investment Canada based on data from Statistics Canada.

By way of comparison, Mersereau (1991) found that in 1986 the import propensity of foreign firms was 37.1 percent in manufacturing, while that of domestic firms was 10.8 percent. The ratio of foreign to domestic propensities (3.5) is slightly lower than the one in the sample used herein, but is still quite high. Alam et al. (1989) also report that in 1984 foreign import propensity was about four times greater. These studies do not suffer from the drawback of an upward bias of import propensities, as calculated in this paper.

A number of qualifications need to be made concerning import propensities. First, the relatively newer foreign operations are likely to source more heavily than the relatively older domestic ones, but firms of similar age may not differ as much in their behaviour; see Graham and Krugman (1989). Second, some foreign-controlled companies classified as manufacturers are really "hybrids between manufacturing subsidiaries and marketing arms, so that the high imports one sees are partly arising from the wholesale trade part of the business"; see Dornbusch et al. (1989).

In spite of these qualifications, foreign-controlled firms still appear to import relatively more than comparable domestic firms. This result is not surprising in light of our finding that the export propensity of these firms is also higher. Thus there is evidence that foreign MNEs are more outward-oriented, in terms of both export and import propensities, than comparable domestic firms.

Comparative Advantage and Intra-Industry Trade

One-sided approaches to trade performance that focus exclusively on the propensity to import of MNEs (or, conversely, on their propensity to export) are inappropriate, as they indicate confusion between changes in the trade balance and welfare effects. Both import and export activities must be examined to produce a coherent theory of international trade. Our findings of both higher import and export propensities for foreign MNEs suggest that the level of Canadian manufacturing trade is greater because of their presence. The important policy issue is how this greater level of trade and possible changes in its pattern caused by foreign MNEs influence Canada's welfare.

The traditional competitive model of international trade identifies the benefits of specialization as the principal contribution of trade to improved living standards. An open economy will specialize in industries in which it has a comparative advantage, as determined by its relative factor endowments (e.g., natural-resource abundance). Unfortunately, it is difficult to identify the sources of comparative advantage, so empirical studies often assume that comparative advantage is "revealed" by market share or net exports normalized for product significance and country size. Ballance et al. (1987) show that different indices of revealed comparative advantage (RCA) can be highly inconsistent. They conclude that net export indices are preferable because of their more solid theoretical foundations.

An important point to bear in mind when interpreting RCA indices is, as Michael Porter (1990) emphasizes, "No nation can be competitive in (and be a net exporter of) everything." Markusen (1992) provides two examples of ways in which industry-level export performance can change without having any consequence for income:

> First, if the faster economic growth in the rest of the world is concentrated in resource-poor countries, then it is natural that they will specialize toward manufacturing, including high-tech, and thus Canada's export shares of non-resource-based industries may decline by more than those of resource-based manufacturing. Second, since shares must by definition sum to one, any change in the domestic economy will in general shift resources such that the share of some sector in total exports (imports) must fall (rise).

Nonetheless, subject to the above limitations, an index of revealed comparative advantage can be a useful indicator of an *industry's* (as opposed to an economy's) competitiveness; see Létourneau (1991).

The comparative-advantage model raises the question of whether the extent of foreign MNE activity in an industry increases or decreases with the industry's competitiveness, as measured by RCA. For example, Dunning (1985) and Globerman (1985) argue that a positive correlation indicates that FDI contributes to allocative efficiency. Globerman's study of Canada uses a net-export measure of RCA for 1980-81 and finds that RCA is positively and significantly correlated with the share of sales by non-US foreign MNEs but negatively and insignificantly correlated with that of U.S. MNEs. This led him to conclude that "only non-U.S. foreign ownership contributes to increased international competitiveness of domestic industries."

Although an industry's RCA and the presence of MNEs are jointly determined, a simple regression of a measure of RCA onto a measure of foreign presence may reveal an interesting stylized fact about FDI. We ran such a regression using an index of net exports based on consistent industry-level export and import data[11] as the dependent variable. The independent variable was the share of industry sales controlled by foreign MNEs in our sample of manufacturing establishments. The regression was run on a pooled, time-series, cross-sectional database for the years 1985-88 and for 14 two-digit SIC industries; it revealed a negative and statistically significant correlation.[12] Such a regression has little explanatory power, but it does indicate that multinationals tend to dominate industries in which Canada does not have a revealed comparative advantage.

How should the negative correlation between an industry's RCA and foreign-firm presence be interpreted? One explanation, consistent with the viewpoint of economic nationalists, may be that domination of an industry by foreign firms makes it less competitive.

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[11] The data were provided by Tony Lempriere of the Economic Council of Canada. The net export index is defined as $NXI=(X-M)/(X+M)$, where X and M represent industry exports and imports, respectively.

[12] The estimated equation was $NXI = 0.614 - 0.01FS$; $R^2=0.29$; and $n=56$.
(0.342) (0.002)

Restrictions on FDI might then help to improve Canadian competitiveness. Another explanation might emphasize the reverse causation; namely, that industries in which the rest of the world has a competitive advantage in exports will also attract FDI. Indeed, if FDI is encouraged by tariffs, one might expect a negative correlation between RCA and the share of foreign ownership, because tariffs are more likely to be imposed in low-RCA industries facing stiff foreign competition. This may explain the observation by Michael Porter (1990) that "successful international competitors often compete with global strategies in which trade and foreign investment are integrated." Although Porter generally opposes restrictions on inward FDI, he views widespread foreign investment as indicating that "the process of competitive upgrading in an economy is not *entirely healthy*."

Recent industrial-organization models of international trade suggest a third explanation, however. This new approach to trade argues that traditional theories of comparative advantage are insufficient because they ignore the role of increasing returns to scale and imperfect competition. Incorporating these factors into trade models leads to a recognition of the importance of intra-industry trade – i.e., trade in goods that are closely substitutable and thus classified as the same commodity but differentiated by such factors as physical characteristics, brand name, and so on. Measures of RCA that focus on *net* exports ignore the potential gains from intra-industry trade.

Focusing on intra-industry trade seems desirable for a number of reasons. First, formal models already exist that explain both intra-industry trade and foreign direct investment within a common industrial-organization framework; see Helpman and Krugman (1985), and Ethier (1986). Second, many Canadian economists have argued that much of Canadian manufacturing trade is intra-industry and therefore best explained by increasing returns and imperfect competition. The study by MacCharles (1987), which provides evidence based on 1979 data that intra-industry trade (IIT) and multinationals are intimately related, is one of the more recent works in this tradition. Finally, as Tables 4-1 and 4-3 show, the motor vehicle industry dominated Canada's manufacturing exports and its imports. This example of intra-industry trade can be contrasted with the more traditional comparative-advantage trade of the resource-based paper industry, which is an important manufacturing exporter but not a substantial importer.

Using the same data as used for the net-export index, we created an index of IIT similar to the one that was first used in the widely cited study by Grubel and Lloyd (1975) and also in MacCharles (1987).[13] This index is regressed onto the same foreign MNE share of sales independent variable (*FS*). The regression reveals a positive and significant correlation between *IIT* and foreign multinational presence.[14] The contrasting results for the net-export index of RCA and the IIT index show that foreign MNEs and domestic firms tend

[13] The index is defined as $IIT = 1 - |X-M|/(X+M)$, where $|X-M|$ refers to the absolute value of net exports.

[14] The estimated equation is $IIT = 0.448 + 0.0035FS$, $r^2=0.12$; and $n=56$.
(0.217) (0.001)

to engage in different types of trade. While domestic-controlled firms tend to do more of the inter-industry trade that results from comparative advantage, MNEs tend to do more of the intra-industry trade that occurs as a result of economies of scale, product differentiation, and so on.

This analysis should be regarded as only the first step towards a consistent explanation of the role of MNEs in shaping Canada's trade performance. Its principal shortcoming is the high level of aggregation at which it is carried out. Greenaway (1985), in his commentary on the measurement of product differentiation in empirical studies of trade flows, argues that the Grubel and Lloyd index is most appropriate for data that can be disaggregated to the three- or four-digit SIC level. Nonetheless, if foreign MNEs are shifting Canada's trade pattern towards intra-industry trade and away from traditional comparative-advantage trade, they may be allowing the country to reap benefits based on economies of scale instead of specialization in production.

Intra-Firm Trade

The global direct investment boom has been accompanied by a growing reliance on intra-firm trade – the international exchange of goods and services between affiliated firms. Investment Canada (1990) estimates that "some one-third of world trade in manufactured goods is ... intra-company trade." According to the U.S. Department of Commerce, between 1982 and 1985 intra-firm trade increased to nearly half of U.S. exports to Canada and more than a third of U.S. imports from Canada. The degree of reliance on intra-firm trade is one of the unique aspects of the U.S.-Canada trading relationship.

Our import data sample makes it possible to identify which imports are intra-firm. The proportions of imports that were intra-firm in 1988, for foreign and domestic companies, are shown in Table 4-4. Imports from the affiliates of domestic-controlled MNEs account for a small share of total intra-firm imports in Canadian manufacturing (3.53 percent in 1988). They do, however, constitute approximately 15 percent of the imports of domestic-controlled manufacturing firms, and substantially more in the machinery, fabricated and primary metals, and electrical products industries. These figures are shown mostly for the purpose of comparison with foreign MNEs.

Table 4-4
Intra-Firm Imports as a Proportion of Total Imports, Canada, 1988

Industry	1988[a]	
	Domestic	Foreign
Food and beverages	7.70	37.26
Rubber and plastics	2.29	69.01
Textiles	10.62	70.38
Wood	9.50	10.17
Furniture and fixtures	11.47	75.84
Paper and allied products	8.30	35.89
Printing and publishing	2.37	45.43
Primary metals	23.27	59.60
Fabricated metal	20.77	41.54
Machinery	51.06	80.49
Transportation equipment	9.68	64.93
Motor vehicles	8.10	65.55
Other transportation	13.47	59.62
Electrical products	19.50	46.60
Non-metallic mineral products	3.25	60.71
Petroleum and coal	0.06	15.72
Chemicals	15.11	58.80
Miscellaneous manufacturing	6.74	88.45
Total manufacturing	14.51	63.29

[a] Based on harmonized classification.

Source: Computations by the Economic Council of Canada and Investment Canada based on data from Statistics Canada.

As one would expect, the intra-firm imports of foreign-controlled firms constitute a much larger share of their manufacturing imports – approximately 63 percent in 1988. A breakdown by industry shows that approximately 80 percent of imports in machinery and about 65 percent in transportation (1988) are intra-firm. The 1988 figures for intra-firm imports are highly comparable to those reported in the studies by Alam et al. (1989) and Mersereau (1991), which used a slightly broader sample.

International trade that occurs within a single firm is likely to affect a nation's competitiveness differently than trade that occurs via the market. First, greater intra-firm trade may change the influence of macroeconomic variables, such as exchange rates, on aggregate trade flows. As Julius (1990) points out (p. 24): "Those actors [that] have diversified their operations across markets ... have grown more resistant to exchange rate swings and more flexible in avoiding their adverse effects."

Goldsborough (1981) provides econometric evidence that intra-firm trade in the United States is much less sensitive to changes in aggregate demand and relative prices than trade through conventional channels. Given the importance of FDI in Canada, the degree of intra-firm trade is greater in Canada than in the United States, and the implications for macroeconomic policy can be expected to be more pronounced.

Second, to the extent that intra-firm trade is a means by which both vertical specialization (reduction in the number of stages of production) and horizontal specialization (reduction in the number of product lines) are realized, greater intra-firm trade will, other things being equal, improve the productivity of local affiliates'; see Casson (1986). McFetridge (1989) argues that the competitiveness of these affiliates can be enhanced if the domestic market is so small that local specialization is not sufficient to exhaust plant scale economies or if specialized arrangements between affiliated firms economize on the transaction costs of market exchange.

MacCharles (1987) employs an index of the ratio of the cost of materials purchased to value-added (referred to as VS, or vertical specialization) to examine specialization in Canadian manufacturing. This ratio should be positively related to the degree of specialization because the more a firm "contracts out" in order to specialize in production, the greater the cost of materials purchased relative to value-added. Over the period 1960 to 1979, the export-oriented industries – transportation; paper and allied products; petroleum and coal; and non-metallic minerals industries – showed a positive change in the VS ratio. Industries displaying relatively greater intra-industry trade also had a greater VS ratio. This category included furniture and fixtures; metal fabricating; machinery; transportation equipment; and chemicals.

In order to examine how vertical specialization has changed in recent years, we calculated MacCharles's VS index using 1988 data from our sample of manufacturing establishments. Industries that had a high VS for the years 1960 to 1979 did not necessarily continue to specialize into the 1980s. For example, furniture and fixtures, paper and allied

products, metal fabricating, and petroleum and coal did not change significantly from 1979, suggesting that the degree to which firms could specialize was either complete or restricted. Industries in which specialization continued included transportation equipment and machinery. Most other industries remained at their 1979 VS level.

An Analysis of Intra-Firm Trade

Two recent studies provide some evidence of how intra-firm trade may economize on transaction costs, as internalization theory suggests. Cho (1990) examines how intra-firm trade in U.S. manufacturing relates to technology intensity, product-related economies of scale, the extent of vertical integration, and the intensity of international production. He finds that technology intensity is positively related to the amount of intra-firm trade, but economies of scale have a constraining effect. Vertical integration and international production intensity were not found to have a statistically significant influence on intra-firm trade. Siddharthan and Kumar (1990) investigate the influence of similar industry characteristics, including technology intensity, skill intensity, selling expenses, capital-requirement intensity, international orientation, and pollution intensity. Their most prominent result is that intra-firm trade is higher in technology-intensive industries (measured by R&D intensity) and skill-intensive industries (measured by average wages and salaries per hour).

The data sample used herein enabled the authors to perform a similar statistical analysis of intra-firm trade. They have postulated the following linear model (with the expected signs of independent variables in parantheses):

$$ITM = f(VS, HT, FS, FD, SKILL, LQ, CETTS)$$
$$(+)\ (+)\ (+)\ (+)\ (+)\ (+)\ (\pm)$$

where

ITM	is the ratio of intra-firm imports to total imports by industry;
VS	is the cost of purchased material divided by value-added by industry;
HT	is a dummy variable that takes on the value of 1 if the industry is considered "high-tech" (as defined by the OECD) and 0 otherwis7e;
FS	is the level of sales attributed to foreign firms in an industry;
FD	is a dummy variable to control for differences in ownership;
SKILL	is the skill intensity required in a given industry, proxied by average wages and salary per hour;
LQ	is the proportion of white collar workers – a proxy for labour quality; and
CETTS	is the amount of capital expenditures in an industry relative to sales.

The model uses 1988 data only, comprising 115 three-digit SIC industries. Earlier data were available, but the introduction of the Harmonized System in 1988 made recorded import data more reliable.

The results from the regression analysis are reported in Table 4.5. We find that intra-firm trade is greater in high-technology industries and in industries with greater vertical specialization. Both *HT* and *VS* were statistically significant at the 10 percent level; *FD* was statistically significant at the 1 percent level and indicated that intra-firm imports are 35 percent greater, on average, if the establishment is foreign-controlled. Equations (2) to (4) introduce other factors, but only *LQ* in equation (2) is statistically significant at the 10 percent level. These results are consistent with the findings of Cho (1990) and Siddharthan and Kumar (1990).

The MNE's ability to use intra-firm trade to supply foreign markets gives it greater flexibility in minimizing the total cost of production. Consequently, it may rapidly shift production across affiliates in response to wage-cost differentials, trade barriers, tax differences, and exchange rate fluctuations. This has led to concern that national competitiveness will be substantially eroded following trade liberalization, because local affiliates may be reduced to service and distribution centres. Although the evidence provided in Chapter 3 showed that foreign MNEs do not operate manufacturing plants that employ significantly fewer production workers than domestic establishments, it is still possible that further trade liberalization would cause a movement towards greater "wholesale" activities. McFetridge (1989), using employment-share data to measure location shifts, found that between 1977 and 1984, affiliates of U.S.-based MNEs in several developed countries shifted production in most manufacturing and non-manufacturing industries back to their parents. In addition, a redistribution of production from affiliates in developed countries to affiliates in less developed countries also took place over the same time period.

The results of the previous regression also provide some evidence on the issue of a trend towards "wholesale" activities. The insignificance of the *CETTS* variable means there is no support for the hypothesis that affiliates of foreign MNEs in Canada were reducing the size of their establishments in Canada while simultaneously increasing imports from their parents to Canada during 1988. Given that this was the year leading up to the implementation of the Canada-U.S. Free Trade Agreement, this result appears to be inconsistent with the claim that trade liberalization causes MNEs to increase exports from the home country at the expense of production by host-country affiliates.

Table 4-5
Intra-firm Trade Model

	Dependent variable: Intra-firm imports / total imports			
Equation	(1)	(2)	(3)	(4)
Constant	0.051 (1.48)	-0.054 (-0.82)	-0.052 (-0.45)	-0.001 (-0.02)
VS	0.013* (1.69)	0.013* (1.74)	0.014* (1.80)	0.013* (1.68)
HT	0.112* (1.78)	0.063 (0.92)	0.104* (1.62)	0.095 (1.49)
FD	0.35*** (8.94)	0.34*** (8.62)	0.34*** (8.47)	0.34*** (8.39)
FS		0.094 (1.33)	0.088 (1.24)	
LQ		0.189* (1.32)		
TARIFF			0.005 (1.19)	
SKILL			0.0001 (0.14)	
CETTS				-3.75 (-0.37)
ADJ. R-SQ.	0.416	0.421	0.413	0.411
SSE	21.26	17.4	14.3	16.9
N	115	115	115	115

*** Statistically significant at the 1 percent level
** Statistically significant at the 5 percent level
* Statistically significant at the 10 percent level
Note: Figures in brackets are the respective *t*-statistics.

CONCLUSION

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The issues raised by the debate over Canada's international competitiveness are vast, and they touch upon almost every aspect of applied economics. This study has focused on how foreign multinational enterprises shape productivity and trade performance - two key factors of competitiveness. Its major findings are as follows:

Productivity and Competitiveness

1. The level of labour productivity of foreign MNEs is greater than that of domestic firms in most manufacturing industries.

2. Foreign-controlled plants are usually more productive than domestic-controlled plants of comparable size. The productivity gap is largest in the medium size-class.

3. Foreign-controlled plants have a statistically significant productivity advantage, even after differences in plant scale, labour intensity, energy intensity, and industry-level technology characteristics are taken into account.

4. The greater the trade barriers in an industry, the larger the productivity gap between foreign and domestic firms. Relative energy intensity also explains some of the productivity gap.

5. There are no significant differences between foreign and domestic plants at the level of total manufacturing with respect to wages and salaries per hour or to production workers as a proportion of total workers.

Trade and Competitiveness

6. Foreign MNEs account for 75 percent of Canada's manufacturing exports, and foreign firms have a much greater outward orientation than domestic firms (with 73 percent higher export propensity).

7. Foreign MNEs account for 80 to 88 percent of imports, and their propensity to import is four to five times greater than that of domestic-controlled firms.

8. Foreign MNEs tend to be located in industries in which Canada has a revealed comparative disadvantage.

9. Intra-firm imports by foreign MNEs accounted for approximately 95 percent of all intra-firm imports and for approximately 60 percent of total imports in 1988.

10. The intra-firm trade of foreign MNEs in 1988 tended to be highest in industries with a high degree of vertical specialization; it was also high in high-technology industries.

The empirical findings of this study suggest that foreign multinational enterprises have made a positive contribution to Canada's international competitiveness. The productivity performance of foreign-controlled manufacturing establishments is generally superior to that of domestic-controlled firms, even after differences in factor proportions and industry characteristics are taken into account. This finding is consistent with theories of the MNE emphasizing firm-specific assets that create ownership advantages. By making the services of such assets available without costly duplication, foreign direct investment increases Canada's welfare.

Foreign investment in Canada may also lead to the introduction of superior technology into the country, as foreign subsidiaries have access to the superior technology of their parents. Furthermore, foreign-controlled firms are more outward-oriented than domestic-controlled firms and tend to be located in industries with greater intra-industry trade. This suggests that the presence of foreign MNEs allows gains from trade over and above those which would occur from arms-length, comparative-advantage-based trade.

APPENDIX A
DATA ON MNE ACTIVITY

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This appendix describes the data used for the analysis of inward multinational enterprise and domestic-firm activity in Canada from 1985 to 1988. The selection of multinational enterprises is based on data files from the Industrial Organization Finance (IOF) division of Statistics Canada – the division that defines all multinational enterprises operating in Canada. Information on enterprise ownership and country of control is based on Inter-Corporate Ownership (Catalogue 61-517) Corporations that have identified country of control do so under the *Corporations and Labour Unions Returns Act* (CALURA). The Act applies to all Canadian corporations whose gross revenue exceeds $15 million and whose assets exceed $10 million. In addition, ownership information must also be provided by any corporation having a long-term debt or equity owing directly or indirectly to non-residents of Canada and having a book value that exceeds $200,000.

The country-of-control designation does not necessarily identify ownership of the immediate parent, but it does identify the ultimate parent ownership. Corporate control has the potential to affect the strategic decision-making process of the board of directors of a corporation.

"Effective control" is control of a corporation through methods other than ownership of the majority voting equity of the corporation. This occurs where more than 50 percent of the directors of the corporation are also directors of a trust or an estate, or where there exists a significant voting relationship between corporations. Effective control also exists if the corporation holds more than a 33 percent voting equity in another corporation and if that block exceeds the combined percentage of the next two largest blocks. Finally, there is effective control if control is acknowledged by a corporation.

Foreign control exists if a majority of the voting rights are held in a foreign country or if the Canadian corporation holding majority voting rights is foreign-controlled. If a multi-corporation enterprise is reporting, then the enterprise is assigned a country of control and all of their subsidiaries share that designation. Country of control is awarded to the foreign country with the largest block of voting equity. If the corporation is equally owned by Canadian and foreign interests, then the country of control will be assigned to the foreign owner.

The set of MNEs from the IOF division was linked to the Capital Expenditures (CE) file. The data on capital expenditures are based on the annual "Capital and Repair Expenditure" survey (the long form) undertaken by the Science, Technology and Capital Stock Division of Statistics Canada. Capacity expansion and replacement, and/or modernization, are reported as percentages of non-residential construction and machinery and equipment. These are assigned dollar values on the basis of the total amounts reported for

non-residential construction and machinery and equipment. Approximately 4,300 manufacturing establishments – both foreign- and domestic-controlled – are surveyed. The respondents included in our sample each spent $1 million on machinery and equipment in the preliminary survey.

The next step was to link those establishments to the Census of Manufacturing file (CM). The CM file provides detailed information on each establishment's operation, including employment, shipments, wages and salaries, value-added, and exports (1987 only). The most recent year for which data are available from the CM file is 1988.

Using a response to the Capital Expenditures Survey as a selection criterion gives us a large but variable fraction of the universe of manufacturing sales and employment. As an indication of the relationship between the sample and the universe, consider that the establishments in the sample accounted for 46 percent of manufacturing sales in 1985; 38 percent in 1986; and 39 percent in 1987, the last year for which published data are available. Note that coverage of the universe of establishments also varies by industry.

Most small manufacturing establishments are not included in the sample. The average number of employees per manufacturing establishment, according to the 1985 census, was 48, whereas the average for the establishments in our sample in that year was 595. The focus on large establishments implies that foreign-controlled establishments account for a greater percentage of sales in our sample than if the entire universe had been used. In 1985 foreign-controlled firms accounted for 67.3 percent of manufacturing sales in our sample, but for only 48.7 percent of those of the universe of manufacturing establishments.

Only 1987 data were available for exports, since that survey is only carried out once every five years. This left a total of 711 observations. Given that the sample is based on larger-than-average establishments, the sample accounts for a larger proportion of total manufacturing exports (49.7 percent) than of sales (39 percent).

The last file to be linked up with the CE and CM files was the import file. The import file contains information on each enterprise's import activity. That includes the type and quantity of product(s) imported, the total value of products imported, and the value of intra-firm trade. Since the import file records data at the enterprise level, this information had to be mapped onto the CM and CE files, which contain establishment-level information. The imports of each company were evenly allocated to each of the establishments in the sample that it controls. The three files were then combined to make one large data file on each establishment. That gave us a sample of $48.6 billion in 1987, which accounted for 63 percent of all manufacturing imports. Table A-1 shows the results for the import propensities of foreign and domestic firms, as well as the ratio of the two.

Table A-1
Import Propensities of Foreign and Domestic Companies in Canada, 1985-88

Industry	Imports as a Proportion of Total shipments[a]		
	Foreign (%)	Domestic (%)	Foreign/domestic ratio
Food and beverages	23.02	17.68	1.30
Rubber and plastics	98.31	64.39	1.52
Textiles	318.5	93.25	3.42
Wood	19.81	27.11	0.73
Paper and allied products	7.51	9.22	0.81
Printing and publishing	244.25	11.97	20.41
Primary metals	394.47	33.83	11.66
Fabricated metal	71.50	73.29	0.98
Machinery	427.58	147.65	2.90
Transportation equipment	335.04	94.81	3.53
Motor vehicles	365.85	221.58	1.65
Other transportation	196.11	48.70	4.02
Electrical products	111.71	69.84	1.60
Non-metallic mineral products	301.49	17.85	16.89
Petroleum & coal	93.63	106.74	0.88
Chemical	65.10	34.96	1.86
Miscellaneous manuufacturing	119.38	82.94	1.44
Total manufacturing	171.07	34.31	4.99

[a] Company-level imports divided by total shipments of affiliated establishments in the sample.

Source: Computations by the Economic Council of Canada and Investment Canada based on data from Statistics Canada.

APPENDIX B
DETERMINANTS OF PRODUCTIVITY: FURTHER RESULTS

APPENDIX B
DETERMINANTS OF PRODUCTIVITY: FURTHER RESULTS

Tables B-1 and B-2 show the regression results from the productivity-determinants model (foreign and domestic samples). All models, including those shown in Tables 3-3, 3-4, and 4-6, apply White's Heteroscedastic-Consistent Covariance Matrix estimation to correct the estimates for an unknown form of heteroscedasticity. A correction for autocorrelation was also applied where appropriate. In all the models, both the right- and left-hand-side variables were expressed in nominal values. This was done because the appropriate deflators were not available. To determine the extent to which value-added per employee is affected by nominal values, separate regressions were run for each year; it was found that the influence of each factor remained virtually unchanged with the exception of the market-structure variables *CR4* and *TARCON4*. Both *CR4* and *TARCON4* became less statistically significant (having gone from the 5 percent to the 10 percent level).

Determinants of Productivity

The Foreign and Domestic Samples

The model was regressed separately onto samples of exclusively foreign and exclusively domestic establishments to examine more closely the influence of different factors on labour productivity. The regression results are reported in Tables B-1 and B-2. Both models define labour productivity as value-added per employee and were specified in double-log form. The models used pooled cross-section times-series data. The domestic model contained 160 observations (40 industries times 4 years); the foreign model contained 232 observations (58 industries times 4 years).

The establishment-level factors (*SCALE*, *LQ*, *EN*, and *LK*) performed as in the total sample, with the exception of the *LQ* (proportion of white collar workers), which was not statistically significant in the foreign sample. This may reflect the fact that some of the administrative work is done in the home country; see Globerman (1979). An examination of the means of selected factors in foreign and domestic establishments (Table B-3) shows, however, that the average value of *LQ* was virtually identical across all manufacturing in both types of plants.

The LK elasticity is approximately 10 percent higher and the *EN2* elasticity approximately 25 percent lower in domestic firms. That is accounted for, in part, by the fact that the mean value of *LK* is 13 percent higher in domestic plants and energy intensity is one and a half times greater in foreign plants (see Table B-3). It is interesting to note that while energy intensity is greater in foreign plants, the cost of energy as a proportion of the total material cost is 25 percent lower in foreign plants.

The *SCALE* variable was not statistically significant in either foreign or domestic plants. A comparison of the mean *SCALE* variable across all manufacturing indicates that foreign-controlled plants are 30 percent larger, on average, than domestic-controlled plants.

In equations (1) to (5) in Tables B-1 and B-2, it is revealed that foreign and domestic plants react quite differently to certain industry factors – namely, trade barriers and market structure. In the case of trade barriers (*TARIFF*), labour productivity in foreign-controlled plants was unaffected by tariff and non-tariff barriers; on the other hand, the productivity in domestic-controlled plants was affected quite significantly (at the 1 percent level) by tariff and non-tariff barriers. This latter finding lends support to the Eastman-Stykolt hypothesis that domestic firms have a tendency to operate suboptimally when protected by trade barriers. Market structure was also shown to affect foreign- and domestic-controlled firms differently; the more concentrated the industry, the higher the productivity of foreign-controlled plants and the lower the productivity of domestic-controlled plants. This finding may be seen as evidence against the structure-conduct-performance paradigm.

A Chow-test was performed to determine whether labour productivity in both foreign- and domestic-controlled firms could be described by the total model. In other words, the null hypothesis is set up to test whether the domestic and foreign models can be described by one regression model. The following ratio was formed:

$$F^* = \frac{[SSE(t) - (SSE(d) + SSE(f))] / K}{(SSE(d) + SSE(f)) / (n+m-2k)}$$

where

$SSE(t)$ = the sum of squared errors from the total model;
$SSE(d)$ = the sum of squared errors from the domestic model;
$SSE(f)$ = the sum of squared errors from the foreign model;
K = the number of factors including the constant term;
n = the number of observations in the domestic model; and
m = the number of observations in the foreign model.

If $F^* > F_{.01}$, we reject the null hypothesis; since $F^* = 17$ and $F_{.01} = 2.51$, the null hypothesis can be rejected. Thus we accept that the domestic and foreign models are described as two different models.

Table B-1
Determinants-of-Productivity Model: Domestic Sample

Dependent variable: Value-added per employee

Equation	(1)	(2)	(3)	(4)	(5)
Constant	11.81***	11.86***	11.84***	11.86***	11.84***
	(67.94)	(69.83)	(53.85)	(68.9)	(66.86)
LK	-0.517***	-0.507***	-0.531***	-0.507***	-0.508***
	(-11.2)	(-11.1)	(-11.3)	(-11.2)	(-10.98)
SCALE	0.014	0.014	0.012	0.132	0.0693
	(.429)	(0.443)	(0.379)	(0.411)	(0.202)
LQ1	0.096**				
	(1.98)				
LQ2		0.129***	0.148***	0.127**	0.127**
		(2.719)	(2.83)	(2.277)	(2.306)
EN1			0.041*		
			(1.62)		
EN2	0.075***	0.0745***		0.076***	0.075***
	(3.22)	(3.312)		(2.851)	(2.81)
TARIFF	-0.061***	-0.058***	-0.067***	-0.058***	-0.058***
	(-2.94)	(-3.02)	(-3.17)	(-2.86)	(-2.84)
R&D	0.075***	0.072***	0.072**	0.071***	0.073***
	(2.61)	(2.57)	(2.221)	(2.54)	(2.56)
HT			0.006	0.011	0.016
			(0.164)	(0.149)	(.235)
CR4	-0.089	-0.088	-0.035	-0.091	-0.091
	(-0.91)	(-0.89)	(-.342)	(-0.91)	(-.91)
FS2					-0.014
					(-0.76)
ADJ. R-SQ.	0.734	0.744	0.732	0.743	0.742
SSE	9.1	8.7	9.2	8.8	8.7
N	160	160	160	160	160

*** Statistically significant at the 1% level.
** Statistically significant at the 5% level.
* Statistically significant at the 10% level.
Note: Figures in brackets are the respective *t*-statistics.

Table B-2
Determinants-of-Productivity Model: Foreign Sample

Dependent variable: Value-added per employee				
Equation	(1)	(2)	(3)	(4)
Constant	11.65***	11.65***	11.5***	11.65***
	(106.64)	(108.5)	(85.65)	(108.4)
LK	-0.461***	-0.463***	-0.483***	-0.461***
	(-12.9)	(-13.1)	(-13.3)	(-13.1)
SCALE	0.024	0.025	0.012	0.025
	(.939)	(1.001)	(0.379)	(1.011)
LQ1	0.014			
	(0.51)			
LQ2		0.034	0.035	0.031
		(1.26)	(1.32)	(1.117)
EN1			0.035**	
			(2.32)	
EN2	0.095***	0.094***		0.098***
	(5.88)	(5.941)		(5.713)
TARIFF	-0.002	-0.002	-0.028	-0.001
	(-0.13)	(-0.12)	(-1.17)	(-0.04)
R&D	0.073***	0.067***	0.056***	0.067***
	(3.57)	(3.33)	(2.608)	(3.28)
HT			-0.04	0.03
			(-1.04)	(0.719)
CR4	0.161**	0.177**	0.239***	0.175**
	(2.16)	(2.443)	(3.072)	(2.41)
ADJ. R-SQ.	0.814	0.815	0.795	0.815
SSE	8.99	8.94	9.86	8.93
N	232	232	232	

*** Statistically significant at the 1% level.
** Statistically significant at the 5% level.
* Statistically significant at the 10% level.
Note: Figures in brackets are the respective *t*-statistics.

Table B-3
Mean Values of Selected Data on
Foreign and Domestic Plants, in Canada, 1985-88

	Mean Value		
	Foreign	Domestic	Percentage
Value-added per employee	85051	70898	21%
LK	0.71	0.82	13%
EN1	0.1	0.04	150%
EN2	0.03	0.04	-25%
SCALE	0.57	0.44	30%
LQ1	0.25	0.25	0%

APPENDIX C
THE PRODUCTIVITY GAP

APPENDIX C
THE PRODUCTIVITY GAP

The following log-linear model was postulated to explain the productivity gap (*LP*gap):

$$LP\text{gap} = g(RSCALE, RLQ, REN, RLK, R\&D, TARIFF, HT, CR4, TARCON4),$$

where the *R* in front of *SCALE*, *LQ*, *LK*, and *EN* indicates the ratio of the value of the variable in foreign firms to that on domestic firms. The results of the productivity-gap regression are reported in Table C-1.

The most statistically significant explanations of the productivity gap are relative energy input and trade barriers. Even though plants within the same four-digit industry were being compared, both *REN1* and *REN2* (significant at the 5 percent and 1 percent levels, respectively) had a strong influence on the size of the productivity gap. The strength of the energy-intensity variables is surprising, given that relative labour intensity (*RLK*) was not statistically significant. One possible explanation is that MNEs are attracted to more resource-based manufacturing. Our comparison is made at a fairly disaggregated level, however, so such industry-level differences should not be very important. Another possible explanation would appeal to energy-related technological differences. Inefficient energy utilization is often cited as an important factor in Canada's manufacturing productivity slowdown; see, for example, Rao and Lempriere (1990). Given that firms operating outside Canada were more exposed to energy-price shocks, their Canadian affiliates might have been more apt to have adopt newer, more energy-efficient technologies.

The *TARIFF* variable was also significant at the 1 percent level, indicating that the productivity gap widens in industries that are protected by tariff and non-tariff barriers. This implies that trade liberalization might reduce the productivity gap by forcing domestic firms to produce more efficiently. Although the Eastman-Stykolt hypothesis has often been invoked to explain the productivity gap between Canadian and U.S. manufacturing, our results suggest that a similar mechanism may explain productivity differences between firms *within* Canadian manufacturing. Firms controlled by foreigners may have adopted aggressive strategies designed for the continental market, while firms controlled by Canadians may have elected to pursue more collusive strategies, even though both have a protected Canadian market.

The *HT* and *R&D* variables were both negative, but they were statistically insignificant. The negative signs for these variables, which suggest that the productivity gap is smaller in high-technology industries, is not surprising given some of the results. For example, foreign MNEs had one of their largest productivity advantages in the "low-tech" food-related industries (Table 3-2).

Table C-1
The Productivity-Gap Model

Dependent variable: Value-added per employee (foreign/domestic)			
Equation	(1)	(2)	(3)
Constant	0.423 (0.59)	0.614 (0.82)	0.483 (0.61)
RLK	-0.044 (-1.57)	-0.037 (-1.28)	-0.042 (-1.35)
RSCALE	0.458 (0.66)	0.301 (0.43)	0.486 (0.74)
RLQ1	0.051 (0.43)		
RLQ2		0.0003 (0.005)	0.148*** (2.83)
REN1			0.057** (2.42)
REN2	0.052*** (4.22)	0.054*** (4.47)	
TARIFF	0.067*** (2.85)	0.068*** (2.93)	0.066*** (2.61)
R&D	-3.45 (-.089)		-3.99 (-0.98)
HT		-0.833 (-1.56)	-0.609 (-1.16)
CR4	0.418 (0.62)	0.382 (0.59)	0.645 (0.93)
ADJ. R-SQ.	0.19	0.20	0.11
SSE	211.4	208	230
N	124	124	124

*** Statistically significant at the 1% level.
** Statistically significant at the 5% level.
* Statistically significant at the 10% level.
Note: Figures in brackets are the respective *t*-statistics.

The larger the foreign firm relative to the domestic firms, the wider the productivity gap seems to be; but the result is not statistically significant. That is borne out by Table 3-2, which shows that there are large productivity differences even among firms in similar size-classes.

The productivity gap was not affected by the differences in labour quality between foreign and domestic firms in the first two equations shown, but *RLQ2* was highly significant in the last one. That is one of the few results that were not robust to slight changes in model specification.

BIBLIOGRAPHY

BIBLIOGRAPHY

Alam, J.; Li, S. Y.; and Oldenburg, R. "Analysis of Performance of Foreign Multinational Enterprises". Ottawa: Ministry of Industry, Science and Technology, 1989 (mimeo).

Baldwin, J. R. and Gorecki, P. Trade, Tariffs, Product Diversity, and Length of Production Runs in Canadian Manufacturing Industries: 1970 - 1979. Discussion Paper no. 247. Ottawa: Economic Council of Canada, 1983.

——— The Role of Scale in Canada-U.S. Productivity Differences in the Manufacturing Sector, 1970 - 1979. Toronto: University of Toronto Press, 1986.

Ballance, R. H., Forstner, H.; and Murray, T. "Consistency Tests of Alternative Measures of Comparative Advantage" in the Review of Economics and Statistics (1987).

Bernhardt, I. "Sources of Productivity Differences among Canadian Manufacturing Industries" in the Review of Economics and Statistics, (1980).

Bernstein, J. "R&D Capital, Spillovers and Foreign Affiliates in Canada" in Foreign Investment, Technology and Economic Growth, ed. D. McFetridge. Calgary: University of Calgary Press, 1991.

Blomström, M. Foreign Investment and Spillovers: A Study of Technology Transfer to Mexico. London: Routledge, 1989.

Blomström, M. et al. "U.S. and Swedish Direct Investment and Exports" in Trade Policy Issues and Empirical Analysis, ed. R. Baldwin. Chicago: Unversity of Chicago Press, 1988.

Britton, J.N.H. and Gilmour, J. M. The Weakest Link. Ottawa: Science Council of Canada, 1978.

Cantwell, J. "The Technological Competence Theory of International Production and Its Implications" in Foreign Investment, Technology and Economic Growth, ed. D. McFetridge. Calgary: University of Calgary Press, 1991.

Casson, M. Multinationals and World Trade. London: Allen and Irwin, 1986.

Caves, R. E. "International Corporations: The Industrial Economics of Foreign Investment" in Economica 38(1971).

——— Multinational Enterprise and Economic Analysis. Cambridge: Cambridge University Press, 1982.

——— Adjustment to International Competition. Ottawa: Economic Council of Canada, 1990.

Cho, K. R. "The Role of Product-Specific Factors in Intra-Firm Trade of U.S. Manufacturing Multinational Corportations", in the Journal of International Business Studies (1990).

Coase, R. H. "The Nature of the Firm" in Economica 4 (1937).

Davidson, C.; Matusz, S. J.; and Kreinin, M. "Analysis of Performance Standards for Direct Foreign Investments" in the Canadian Journal of Economics 18, no.4 (November 1985).

Dornbusch, R.; Krugman, P.; and Park, Y. C. Meeting World Challenges: U.S. Manufacturing in the 1990s. Rochester: Eastman Kodak, 1989.

Dunning, J. The Multinational Enterprise. London: Allen and Unwin, 1972.

——— "The United Kingdom" in Multinational Enterprises, Economic Structure and International Competitiveness, ed. J. Dunning. New York: John Wiley and Sons, 1985.

——— Multinationals, Technology and Competitiveness. London: Allen and Unwin, 1988.

Eastman, H. and Stykolt, S. The Tariff and Competition in Canada. New York: St. Martin's Press, 1967.

Ethier, W. "The Multinational Firm", in the Quarterly Journal of Economics (1986).

Froot, K. and Stein, J. "Exchange Rates and Foreign Direct Investment: An Imperfect Capital Markets Approach". NBER Working Paper No. 2914. Cambridge, Mass.: National Bureau of Economic Research, 1989.

Globerman, S. "Foreign Direct Investment and 'Spillover' Efficiency Benefits in Canadian Manufacturing Industries" in the Canadian Journal of Economics, 12, no.1(1979).

——— "Canada" in Multinational Enterprises, Economic Structure and International Competitiveness, ed. J. Dunning. New York: John Wiley and Sons, 1985.

Goldsborough, D. J. "International Trade of Multinational Corporations and Its Responsiveness to Changes in Aggregate Demand or Relative Prices", in IMF Staff Papers 28:3(1981).

Gorecki, P. K. Economies of Scale and Efficient Plant Size in Canadian Manufacturing Industries. Ottawa: Bureau of Competition Policy, Department of Consumer and Corporate Affairs, 1976.

Graham, E. M. and Krugman, P. Foreign Direct Investment in the United States. Washington: Institute for International Economics, 1989.

——— "TRIMs in the Uruguay Round" in Completing the Uruguay Round: A Results Oriented Approach to the GATT Trade Negotiations, ed. J. J. Schott. Washington: Institute for International Economics, 1991.

Greenaway, D. "The Measurement of Trade in Differentiated Products" in Monopolistic Competition and International Trade, ed. H. Kierzowski. Oxford: Clarendon Press, 1985.

Grubel, H. and Lloyd, P. Intra-Industry Trade: The Theory and Measurement of International Trade in Differentiated Products. New York: John Wiley and Sons, 1975.

Harris, R. G. "Strategic Trade Policy, Technology Spillovers and Foreign Investment" in Foreign Investment, Technology and Economic Growth, ed. D. McFetridge. Calgary: University of Calgary Press, 1991.

Hart, O. "An Economist's Perspective on the Theory of the Firm" in Columbia Law Review 89 (1989).

Hazeldine, T. "Too Much Trade? Import Competition and Domestic Pricing", a paper presented at the Canadian Economics Association Meeting, Queen's University, Kingston, June 1991.

Helpman, E. and Krugman, P. Market Structure and International Trade. Cambridge, Mass.: MIT Press, 1985.

Horstmann, I. and Markusen, J. "Strategic Investments and the Development of Multinationals" in the International Economic Review 28 (1987a).

——— "Licensing versus Direct Investment: A Model of Internalization by the Multinational Enterprise" in the Canadian Journal of Economics (1987b).

——— "Firm-Specific Assets and the Gains from Direct Foreign Investment" in Economica 56 (1989).

Hunter, L.; Markusen, J.; and Rutherford, T. "Trade Liberalization in a Multinational-Dominated Industry: A Theoretical and Applied General Equilibrium Analysis". NBER Working Paper No. 3679. Cambridge, Mass.: National Bureau of Economic Research, April 1991.

Hymer, S. The International Operations of National Firms: A Study of Direct Foreign Investment (Ph.D. Dissertation, Massachusetts Institute of Technology, 1960.) Cambridge, Mass.: MIT Press, 1976.

International Monetary Fund. Balance of Payments Manual, 4th edition. Washington, D.C.: International Monetary Fund, 1977.

Investment Canada. International Investment: Canadian Developments in a Global Context, Working Paper No. 6. Ottawa: Investment Canada, 1990.

Julius, D. Global Companies and Public Policy. London: Basil Blackwell, 1990.

Kindelberger, C. American Business Abroad. New Haven, Conn: Yale University Press, 1970.

Klein, M. and Rosengren, E. "Determinants of Foreign Direct Investment in the United States", a Working Paper. Cornell University, 1990.

Krause, W. and Swimmer, D. "Foreign Investment in Canada: Measurement and Definitions". Investment Canada Working Paper No. 12. Ottawa: Investment Canada, 1992.

Létourneau, R. "Performance Commerciale du Canada". Ottawa: Economic Council of Canada, 1991.

Lipsey, Richard G. "Economic Growth: Science and Technology and Institutional Change in a Global Economy", CIAR Publication No. 4. Vancouver, B.C.: Economic Growth and Policy Program, Canadian Institute for Advanced Research, at Simon Fraser University, May 1991.

Lizondo, J. S. "Foreign Direct Investment", IMF Working Paper. Washington, D.C.: International Monetary Fund, 1989.

MacCharles, D. C. Trade Among Multinationals: Intra-Industry Trade and National Competitiveness. London: Croom Helm, 1987.

Markusen, J. R. "Productivity, Competitiveness, Trade Performance and Real Income: The Nexus among Four Concepts", Economic Council of Canada. Ottawa: Canada Communication Group, 1992.

McFetridge, D. G. Trade Liberalization and the Multinationals. Ottawa: Economic Council of Canada, 1989.

——— "The Economics of Industrial Structure: An Overview" in Canadian Industry in Transition. Toronto: University of Toronto Press, 1985.

McFetridge D. G. and Corvari, R. J. "Technology Diffusion: A Survey of Canadian Evidence and the Public Policy Issues" in Technological Change in Canadian Industry, ed. D. G. McFetridge. Toronto: University of Toronto Press, 1985.

Meredith, L. "U.S. Multinational Investment in Canadian Industries" in the Review of Economics and Statistics (1984).

Mersereau, B. "Longitudinal Analysis of Canadian Imports by Characteristics of Importing Firms, 1979-86", a Research Paper. Ottawa: Statistics Canada, 1991.

Mintz, J. and Halpern, P. "Taxation and Canada-U.S. Cross-Border Acquisitions" in Corporate Globalization through Mergers and Acquisitions, ed. L. Waverman. Calgary: University of Calgary Press, 1991.

Organisation for Economic Co-operation and Development. OECD Science and Technology Indicators, No. 2, R&D Invention and Competitiveness. Paris: OECD, 1986.

Porter, M. The Competitive Advantage of Nations. New York: The Free Press, 1990.

Rao, P. S. and Lempriere, T. "Trends in Canada's Competitive Position". Ottawa: Economic Council of Canada, 1990 (mimeo).

Regional Data Corporation. Business Performance Following a Takeover, Investment Canada Working Paper No. 11. Ottawa: Investment Canada, 1992.

Rugman, A. Multinationals and Canada-United States Free Trade. Columbia, S.C.: University of South Carolina Press, 1990.

Safarian, A. E. Foreign Direct Investment: A Survey. Toronto: Institute for Public Policy, 1984.

——— "Rapporteur's Comment" in Corporate Globalization through Mergers and Acquisitions, ed. L. Waverman. Calgary: University of Calgary Press, 1991.

Saunders, R. "The Determinants of Interindustry Variation in Canadian Manufacturing" in the Canadian Journal of Economics 25 (1982).

Scherer, F. M. et al. The Economics of Multiplant Operation. Cambridge, Mass.: Harvard University Press, 1975.

Siddharthan, N. S. and Kumar, N. "The Determinants of Inter-Industry Variation in the Proportion of Intra-Firm Trade: The Behaviour of U.S. Multinationals", in Weltwirtschaftliches Archiv (1990).

Smith, A. "Strategic Investments, Multinational Corporations and Trade Policy" in the European Economic Review 31 (1987).

Statistics Canada. The Canadian balance of international payments and international position. Ottawa: Supply and Services, 1981.

U.S. Department of Commerce, International Trade Administration. "Trends in International Direct Investment". TIA staff paper series (1982-1985).

Vernon, R. "International Investment and International Trade in the Product Life Cycle", in the Quarterly Journal of Economics (1966).

Veugelers, R. and Vanden Houte, P. "Domestic R&D in the Presence of Multinational Enterprises" in the International Journal of Industrial Organization 8 (1990).

Williamson, P. "Multinational Enterprise Behaviour and Domestic Adjustment under Import Threat" in the Review of Economics and Statistics 1986.

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