FOREIGN INVESTMENT DECISIONS OF EUROPEAN COMPANIES:
A TEST OF THE OLIGOPOLISTIC COMPETITION MODEL

by

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ABSTRACT

It is the purpose of this study to investigate the validity of the theory which states that foreign direct investment is, to a large extent, the result of oligopolistic industry structure and government intervention in a freely competitive market, and as such it is chiefly defensive investment by firms which match each others' moves.

As a first step of the analysis the oligopolistic investment theory, its assumptions and implications are presented. For the purpose of statistical investigation information obtained during personal interviews with executives of forty-three internationally operating firms domiciled in seven European countries was used.

Entry Concentration Indices by industry measuring degrees of defensive investment behaviour within each of the five industry groups surveyed, were calculated and correlated with variables expressing oligopolistic conditions in markets of products and factors of production. Entry Concentration Indices by country or area, expressing degrees to which all industries tended to concentrate their investments in certain countries or areas, and ECIs by industry were correlated with variables expressing home and host country government intervention in the economy, such as investment incentives, discouragement of domestic expansion and measures restricting international trade such as tariffs and other restrictive trade policies.

The evidence presented appeared to justify at least partial acceptance of the hypothesis, as the existence of weak positive linkages emerged between ECIs and such variables as degree of product differentiation, market control and particularly level of technological sophistication of the parent firm.

A test involving the profitability of the parent firms and their propensity to react to foreign investment decisions arrived at by their rivals tended to point out that firms operating at low or declining domestic profit margins tended to concentrate their foreign investments to a larger extent than the more profitable companies.

Alternatives to oligopolistic investment behaviour, such as product diversification and licensing, proved to be undesirable courses of action to the oligopolist.

Finally, it was shown that government incentives granted by the authorities of either the firms' home countries or by those of the prospective host countries proved to be ineffective in their impact upon corporate investment decisions. However penalties or restrictions used by governments appeared to have more pronounced effects upon such decisions.

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CHAPTER ONE

I N T R O D U C T I O N

Background

This study is the result of extensive travels throughout Europe
during which executives of major internationally active corporations based
in seven countries were personally interviewed. The information obtained
was extensive and highly valuable, and this writer is grateful for the
cooperation and friendly welcome he received.

Purpose of this Study

Extensive research has been conducted on various aspects of the
operations of multinational corporations, particularly those based in the
United States. Various hypotheses and theories explaining the underlying
determinants of foreign direct investments have been presented. These are
based upon certain assumptions about the behaviour and motivations of
private investors, and the manner in which they arrive at their decisions
to undertake such investments.

It could be of particular interest to industry and governments
of capital importing countries, such as Canada, to recognize the determinants
and motivations of foreign direct investment in order to influence the
investment decision processes of large and internationally powerful firms.

Despite nationalistic trends and policies that have developed in
Canada during recent years, this country will, for the foreseeable future,
still depend on foreign capital for the development of her industry, particularly
the manufacturing sector. Since it may be desirable to stablize or to reduce
the relative dependence on U. S. direct investment, access to European and
Japanese capital would present a possible alternative.[1]

It is the purpose of this study to investigate the proposition that foreign direct investment is, to a large extent, the result of underlying oligopolistic conditions which interfere with or influence the operation of the market, and which thus create the climate for direct investment by industrial enterprises.

Statement of the Hypothesis

A basic hypothesis has been formulated which will be tested as this study progresses.

Foreign direct investment is not necessarily the result of purely economic and rational considerations, as implied by the classic capital-flow and general investment theories.

The capital-flow theory has its merits when relatively short-term portfolio investments are to be explained; however, it proves to be somewhat unsatisfactory, when its basic features are applied to investments in plant and equipment abroad. Foreign direct investment can be explained more effectively by the theory of industrial organization than through the theory of international capital movements.[2]

In a world of perfect competition for products and factors of production, foreign direct investment cannot exist; such conditions would give domestic firms an advantage over foreign enterprises in the proximity of their operations to their decision making centres, so that no foreign subsidiary could survive.[3]

In order for foreign direct investment to come into existence there must be some imperfection in the input and/or output markets, or there must exist governmental interference with the competitive process. Thus foreign investment is, to a large extent, the result of oligopolistic or monopolistic pressures in the market place. Foreign investors are largely

oligopolists responding to oligopolistic investment incentives, and they
rival each other in entering individual foreign markets. It is therefore
hypothesized that oligopolistic industry characterisitics and governmental
interference with the operation of the market exert direct and prime
influences upon corporate investment behaviour. It is further hypothesized
that, because of oligopolistic conditions, foreign investments tend to be
bunched during certain time periods. Thus Entry Concentration[4] should be
a fairly good measure of the degree of oligopolistic competition that
existed among potential foreign investors at the time of entry.

Definitions and Limitations

Definitions

1. Oligopoly

For the purpose of this study the term Oligopolistic Competition
is defined as the type of market structure that exists when few producers
dominate the markets for their products. Oligopoly usually exists in two
types of industry structures. An oligopolist may be one of a few sellers
producing virtually identical products, as is the case in most of the
industries producing basic commodities such as the metals, oil and forest
products industries. Thus this type of oligopoly usually consists of a
few large corporations producing and selling homogeneous products. A second
kind of oligopoly is typified by the situation where there are a few sellers
of differentiated products. This differentiation may be on the basis of
appearance, quality, performance or other features usually emphasized by
advertising, as it is the case among producers of automobiles, chemicals,
electrical products, machinery and other goods that are similarly differentiated.
Table 1-1 illustrates the various kinds of industry structures.

Table 1-1

Most industries are imperfectly competitive—a blend of monopoly and competition:

TYPES OF COMPETITION

KIND OF COMPETITION	NUMBER OF PRODUCERS AND DEGREE OF PRODUCT DIFFERENTIATION	PART OF ECONOMY WHERE PREVALENT	DEGREE OF CONTROL OVER PRICE	METHODS OF MARKETING
Perfect competition	Many producers; identical products	A few agricultural industries	None	Market exchange or auction
Imperfect competition:				
Many differentiated sellers	Many producers; many real or fancied differences in product	Toothpaste, retail trade; conglomerates	Some	Advertising and quality rivalry; administered prices
Oligopoly	Few producers; little or no difference in product	Steel, aluminum, lumber, pulp		
	Few producers; some differentiation of products	Autos, machinery, wallboards		
Complete monopoly	Single producer; single product without close substitutes	A few utilities	Considerable	Promotional and "institutional" public-relations advertising

SOURCE: Paul A. Samuelson and Anthony Scott, <u>Economics</u>, Third Canadian Edition
McGraw-Hill, Toronto, 1971.

There is market interdependence among competitive policies of these few producers, such that under oligopolistic conditions sellers take into account not only the effect of their actions on the entire market; they also calculate the effect of their decisions on one another. Thus oligopoly is defined in terms of both, market structure and the behaviour of the individual firm.[5]

2. Governmental Interference

For the purpose of this study governmental interference is defined as any action on the part of government that aims at restricting, encouraging or significantly influencing the operation of a freely competitive market. This definition applies to prospective host country governments, which, either through incentives or penalties, attempt to attract foreign investors, and to the firms' home country governments which through various policies or lack thereof make it attractive to invest abroad.

3. Foreign Direct Investment

This term includes investments in plant and equipment abroad or significant share interests in foreign corporations. "Investments" in marketing organizations abroad are not considered to be foreign investments for the purpose of this analysis, as they are merely intended to facilitate the individual firm's export business, and as such they are part of decision making which is primarily oriented towards domestic operations.

Foreign investments of banks and other financial institutions were excluded, as they would bias the results of this study. Banks, trust companies, brokerage houses and similar institutions tend to invest abroad initially in order to provide their domestic customers with greater services and assistance. Banks establish foreign affiliates chiefly, because their domestic customers

have become actively involved in international trade, and as a result of this they demand efficient financial services. Rather than yielding this business sector to foreign institutions, the firms' banks establish foreign branches or representative offices which could facilitate international transactions. At a later stage those foreign branches tend to become involved in multilateral rather than merely bilateral financial services.

Another motivation for foreign investments by banks is the attempt to tap untaxed and/or undeclared funds of customers and to invest these monies in tax havens.

> "One of our first foreign investments was the establishment of a branch in Beirut early in this century. We wanted to tap the large pool of funds (believed to be as large as one-quarter of the entire wealth of our country) that people had intention- ally failed to declare for tax purposes. Tax dodgers essentially have two choices: either they invest these funds in gold or hold them in non-interest bearing cash, or they transfer such funds abroad where they can safely be invested, preferably free of taxes, and where they escape the scrutiny of the authorities of the home country. Our branch in Beirut was an ideal vehicle for this purpose at that time; it has, however, over the years, developed a much broader operational base than it had during the early years of its operation."[6]

In a similar manner brokerage houses establish offices abroad chiefly to satisfy the demands of their domestic customers for foreign securities, or of a potential demand for domestic securities by foreigners; another purpose may be to keep abreast with developments in the international securities markets.

Portfolio investments abroad by investment companies or individuals are not included in the definition of foreign investment here. Although such portfolios consist of short-term and long-term securities, investors do not necessarily hold those securities to maturity.

As these investment instruments can, in most cases, be easily marketed, investors tend to buy and sell them, when slight changes in financial market conditions occur, such as relative interest rates and foreign exchange rates.

Investments in plant and equipment, however, represent much more definite and lasting commitments on the part of the investor, and only under highly adverse conditions experienced over fairly long periods will such investments be liquidated. Thus while portfolio investments will be made or disposed of, depending upon financial market conditions at any given time, investments in plant and equipment, once made, will usually be maintained regardless of short-term fluctuations of the business cycle.

4. Subsidiaries

The terms Subsidiary and Affiliate are regarded as being synonymous for the purpose of this study.

5. Entry Concentration Indices

An Entry Concentration Index (ECI) is a quantitative measure of the extent of oligopolistic reaction within a given industry (Entry Concentration Index by Industry) and is based upon the notion that, within a given time period, the number of foreign subsidiaries established in an industry is an indication of the degree of oligopolistic reaction within that industry. ECIs are calculated for 3-year, 5-year, 7-year and 10-year time spans over the post-World War II period (1945-1975); average ECIs are also computed.

Overall Entry Concentration Indices (ECIs by country) simply measure the percentage of subsidiaries established in certain countries or regions by firms of all industries during the above mentioned time spans.[7]

A more detailed description of the method of calculating ECIs is presented in Appendix B.

Limitations

Although fifty-two European firms participated in this project, the information used in this study covers only forty-three corporations in five industries (metals, machinery, automobiles, electrical equipment and chemicals), headquartered in seven continental European countries (Austria, Belgium, France, Germany, Netherlands, Sweden and Switzerland). Five of the firms that were eliminated fell into the category "miscellaneous manufacturing", and their data were not very useful for the purpose of this analysis which investigates specific industries. Of the remaining four firms, three were members of the food industry, but their data were not adequate for the purpose of calculating ECIs; the remaining firm was a public utility firm and the only member of its industrial group.

The Entry Concentration Indices calculated only cover the post-World War II period. Substantial foreign investments were made during the pre-World War I era, but, although this period may be relevant for historical analyses, it is not very useful for the purpose of obtaining meaningful results and for establishing policy guidelines for the future. Economic and industrial behaviour, variables and policies have changed substantially since the close of the First World War to the extent that useful comparisons are difficult to establish. Similarly information covering the inter-war period, which was characterized by economic and political isolation, and by the Great Depression, would not be likely to provide today's policy makers with relevant guidelines.

Financial data for the fiscal year 1972 were used. These data were translated into Canadian dollars at exchange rates prevailing on December 31, 1972.

Because confidential treatment of the information obtained from the participating firms was explicitly promised to their executives, it is not possible to reveal the names of the individual companies and their executives, or individual company data. Thus the information presented here has been aggregated into either industry or country groupings.

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[1] Since already a large proportion of Canadian industry is controlled by United States corporations, many Canadians feel that this degree of control must not increase further. A rather common and justified complaint is that vital economic decisions affecting Canada are made by corporations based in the United States, and this could even result in U. S. government policies, for example the Trading-with-the-Enemy Act, being indirectly imposed on firms operating in Canada.

[2] Stephen P. Hymer: "The International Operations of National Firms,"quoted in: Kindleberger, American Business Abroad, pp. 11 - 12. Yale University Press, New Haven, 1969.

[3] Kindleberger, in op. cit. p. 13.

[4] As defined on p. 7 below.

[5] Frederick T. Knickerbocker: Oligopolistic Reaction and Multinational Enterprise, p. 4. Harvard University, Boston, 1973.

[6] An executive of a major European bank made these comments during a personal interview.

[7] Knickerbocker: in op. cit. pp. 34 - 40.

CHAPTER TWO

STUDY   PROCEDURE

Structure of this Thesis

Chapter Three of this thesis presents the main features of the
oligopolistic competition theory of foreign direct investment, its
assumptions and implications.

In Chapters Four and Five the applicability of this theory
to the foreign investment decision processes of European firms is tested.
Industry Entry Concentration Indices are calculated and correlated
with variables representing corporate characteristics such as oligopolistic
markets of products and factors of production. Alternatives to oligopolistic
investment behaviour, such as product diversification and licensing are
also briefly explored.

Entry Concentration Indices, by countries or areas, are correlated
with variables depicting behaviour patterns of host and home country
authorities. The purpose of these analyses is to establish a model which
may assist in explaining foreign investment behaviour.

Chapter Six summarizes the findings of this study and presents
possible implications that may be useful for potential foreign investors
as well as for host country governments and the formation of their
development policies.

Finally, detailed procedural information is supplied in the
appendices to this thesis.

Selection of a Sample

Internationally active firms headquartered in seven continental
European countries were contacted. Fifty-two companies participated in
this study, but, as explained in the preceding chapter, information
obtained from only forty-three corporations in five industries proved
to be useful for the purpose of testing the hypothesis.[1]

In order to qualify for the purpose of this study the firms
had to meet the following criteria:

a) The individual firm had to be controlled by interests in
the country of domicile; in most cases this meant that
more than fifty percent of the firm's outstanding common
share equity had to be held by residents of the parent
country. This condition was to be met in order to avoid
biases of the results which could arise from extraterritoriality.

b) The individual firm had to maintain physical assets (manufacturing
facilities), or at least substantial minority interests outside
the parent country.

All of the respondent firms satisfied both of these conditions.

How Representative is the Sample

Combined production of the European firms' foreign subsidiaries
approximates $19,500 million. This figure represents approximately twenty-
seven percent of total foreign production of all firms domiciled in the
seven parent countries of the sample, which amounts to $71,300 million.
When figures of other countries are included in the calculation, the
sample would represent twenty-four percent of foreign production of all
European countries excluding the United Kingdom.

Table 2-1 displays the relative weights of the individual country subsamples. Since the United Nations have only published 1971 data and five-year growth rates, data for 1972 was estimated for the purpose of comparison by revising the given 1971 data upward with the use of these growth rates.

Table 2-1

Production of Foreign Affiliates of
European-Based Corporations 1972
(in $ millions)

Parent Country	Total*	Sample	Percent of Total
Austria	207	155	75%
Belgium, Netherlands	14,200	4,896	34%
France	19,706	1,439	7%
Germany	15,686	7,727	49%
Sweden	7,218	1,246	18%
Switzerland	14,500	3,943	27%
All Participating Countries	71,517	19,406	27%
All European Countries **	79,700	19,406	24%

* Estimated

** Excluding The United Kingdom, Iceland and The Republic of Ireland.

SOURCE: UNITED NATIONS, Multinational Corporations in World Development
New York, 1973.

Due to a lack of adequate data it was not possible to arrive at a meaningful figure that could give an indication of the sample's total stock of foreign direct investment in relation to the total book value of European foreign investment. However, percentages not dissimilar to those presented above could be expected.

This can be explained through the technique used for estimating foreign production in the United Nations publication. First the U. N. estimated total book value of the stock of European foreign investment. This figure was then used as a basis for estimating the value of total foreign production by simply multiplying the individual book values by the

factor 2 and accepting the results as being reasonably close estimates for revenues derived from foreign operations. Thus the United Nations assume a static relationship between assets and revenues of foreign affiliates of European corporations.

Key Industries

In most cases, the subsamples reflect fairly the industrial structures of the individual countries. The major European automobile manufacturers, chemical and metal corporations, electrical firms and producers of machinery are represented by the sample.

However, important firms or industrial sectors of some countries are not represented, either because there are no major foreign investors in those sectors,[2] or because some of the firms, which were approached, chose not to participate in this project.[3]

Italian firms were not covered because of the time and financial constraints which arose due to the energy crisis in Europe at the time of the study.[4] Thus some important firms in the automobile, chemical and steel industries of that country were not included in the sample.

Despite these omissions, the major multinational industries of the seven countries were surveyed. The relatively small Austrian subsample was dominated by metal producers, and the Belgium and Dutch subsamples included chemical, food and metal companies. The small French sample was a wide cross-section of French industry, as it represented a variety of different industries, such as automobiles, chemicals, construction materials, cosmetics and metals.

German firms were the largest contingent surveyed which included automobile companies, chemical corporations, metals and electrical equipment producers, and a fashion firm.

Finally the fairly large Swiss subsample was dominated by electrical equipment and machinery manufacturers, but it also included firms in the chemical industry which is an important sector of the Swiss economy. Firms in the leather and metal industries of Switzerland were also surveyed.

As will be further explained in Chapter Three below, most of these firms are oligopolists of varying degrees, and the information obtained during the survey should provide useful data for the purpose of testing the oligopolistic competition theory.

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[1]A more detailed description of the sample selection and data gathering methods is presented in Appendix A.

[2]Some of these industries are the Swiss watch manufacturers, the Austrian textile producers, the Belgian and German photographic industries, German shipbuilding companies, and the Swedish pulp and paper and shipbuilding industries.

[3]Some of these companies were Dutch electrical and artificial fibres producers, Swedish precision instruments and machinery manufacturers, and several important German firms producing electrical equipment, machinery, beverages and precision instruments.

Unfortunately European oil companies that were approached -- some of these were state-owned enterprises -- were unwilling to assist in this study.

[4]This situation was particularly acute during the months of November and December of 1973.

CHAPTER THREE

THE OLIGOPOLISTIC COMPETITION THEORY
OF FOREIGN DIRECT INVESTMENT[1]

Assumptions

The theory which states that foreign direct investment is mainly

spurred by oligopolistic conditions in the market place, is based on a

number of assumptions:

1. Markets for most products and factors of production
   are not perfectly competitive;

2. In most industries there are a few dominating sellers
   rivalling each other;

3. Products of these industries are either close substitutes
   for each other, or they are differentiated by quality,
   advertising tradition, status or by some other methods.

4. Firms in these industries are advanced with respect to
   technology, production and marketing techniques, and
   with respect to the calibre of management, so that
   they have an advantage over local producers in other
   countries.

5. Capital and money markets are not perfectly competitive
   and efficient, and thus not all firms enjoy equally
   easy access to international sources of capital.

6. There are information gaps preventing perfect dissemin-
   ation of knowledge, and thus not all firms enjoy equal
   access to sources of information.

7. Governments do not take a neutral stand on economic matters;
   they try to impose their philosophies on their economies
   thus interfering with the operation of a freely competitive
   and efficient market.

Presentation of the Theory

According to Caves foreign direct investment can be better

explained through an examination of competitive characteristics in the

markets of the home and host countries than through the theory of inter-

national trade and capital movements.[2]

The foreign firm enjoys some advantages over local enterprises in running its operations. Thus there must be come imperfection in the markets for goods and factors of production, because under a system of perfect competition the domestic firm would have an advantage over the foreign firm in the proximity of its operations to its decision-making centre, so that no foreign affiliate could be sustained.

The oligopolistic advantages which induce foreign direct investment can be grouped under four headings:

1. Departures from perfect competition in product markets,

2. Departures from perfect competition in markets of factors of production,

3. Internal and external economies of scale, and

4. Government incentives or penalties affecting the allocation of resources.

Product Markets

The prevalence of foreign investments by producers of branded goods, such as automobiles, machinery and pharmaceuticals, suggests that product differentiation is associated with direct investment. Foreign investment does not normally occur in highly standardized goods produced by competitive industries such as textiles and clothing.

In concentrated industries, such as automobiles, electrical equipment, chemicals and machinery, there also occurs a great deal of cross-investment with, for example, U. S. firms investing in Europe, and their European competitors operating in the United States.

Marketing skills which brought some early U. S. investments to Europe are closely associated with product differentiation through advertising and with administered pricing. In concentrated industries there is also pressure on each firm to develop a position in each potentially

important market -- regardless of the rate of profit obtainable in absolute terms -- in order to prevent any of its few competitors from obtaining a substantial advantage. This causes rivalry among oligopolists resulting in defensive investments abroad which are expressed in the bunching of entries into individual markets during short time spans.

Factor Markets

Superiority in the calibre of management may be the advantage that many companies bring to their foreign investments. Management of those firms is usually highly efficient with respect to cost control and marketing techniques, and it is highly sophisticated in evaluating individual prospects and overall corporate performance. Oligopolists are usually centralized in their decision making; their staff are, however, highly knowledgeable about the international scene and they are sufficiently flexible in adapting to changes quickly.

Large foreign corporations are particularly advantaged vis a vis smaller local firms due to their control over patents, manufacturing technology and other industrial secrets. In the absence of financial and other constraints the firm will most likely establish production facilities abroad, once individual markets have been developed sufficiently to justify local production, and these markets cannot continue to be properly serviced by exporting. Generally under such conditions, oligopolists prefer direct investment over licensing. License fees do not fully compensate the firm for the value inherent in technical, scientific and managerial superiority, and, since licensing arrangements are generally temporary in scope, the

firm can protect its know-how by making use of its manufacturing secrets through the establishment of its own production units abroad. Licenses are, however, less costly in terms of capital, time, energy and risks incurred, and they may be a short-term 'holding' expedient or exploratory mechanism.

A further factor for which the market is imperfect is capital. Occasionally in industries that need large sums of capital for their operations, foreign firms will have an advantage over the often smaller domestic companies because of their superior credit ratings and their ability to raise capital internationally. Even during periods of 'tight' money, oligopolists do not face major difficulties in raising funds while smaller local producers will be unable to do so. Many local enterprises cannot command the large sums needed for capital-intensive investments, as, for example, in the extractive industries, and in the steel and automobile sectors.

Economies of Scale

The advantages of large-scale production internal to the firm are self-evident, although there are some counterbalancing diseconomies of scale in administering such large production units, setting limits to the optimum scale of operations.[3]

Internal economies of scale -- and monopoly -- account mainly for horizontal integration. In some situations, where products are bulky, inventories are expensive and coordination of decisions is required at various stages of the production process, the firm may be better equipped to organize production than leaving such decisions to many producers in an international competitive market.

External economies of scale usually lead to vertical integration. Both, backward and forward integration can produce greater economies than dealing with suppliers and customers at arms length. Large steel companies have interests in coal and iron ore mines, and they are also engaged in secondary manufacture, such as tools, springs, axles and casings. Aluminum producers have control over the entire production process from bauxite mining via ingot production to the end product such as aluminum foil, siding and household articles. The large international oil companies have been prime examples of firms being completely vertically integrated, as they control all of the stages of the business from extracting the crude to marketing the refined products at the retail level, or converting the crude in their petrochemical divisions into chemicals, plastics and other products sold to the end user. However, similar to developments in the aluminum industry, the competitive structure of the international oil industry is undergoing significant changes due to government interference, particularly in the host countries.

Authorities in the oil producing nations[4] have displayed greater self-conscience and nationalism during recent years, and they have adopted measures to ensure greater control over their natural resource.[5]

In most oil consuming countries, the multinational oil companies are being subjected to increasing public scrutiny. In some countries, particularly the United Sates and Germany, allegations have been made accusing the petroleum companies of aggravating the energy shortages that arose during the recent energy crisis by withholding supply in order to obtain higher prices.[6] Regardless of whether or not such accusations can be verified, the operations of international oil companies will probably be subjected to greater degrees of governmental control in the future.

Vertical integration does not always necessarily occur to produce significant economic advantages such as lower prices or costs. Firms may merely integrate vertically, because they want to ensure continuous and undisturbed supply of the raw materials extracted by their affiliates and transported on vessels owned by a shipping subsidiary established expressly for this purpose.[7]

Government

The role of the host government does not affect the choice between local and foreign firms, except when it prohibits or restricts foreign investment. If, however, the choice is between importing of the products and local manufacture, then government policies affect foreign direct investment. Such policies may be in the area of direct trade regulations, such as tariffs, quotas, local-content rules or complete prohibition of imports. There are also various fiscal and financial means by which the prospective host country can attract investors. Favourable taxation policies can be established granting tax deferments, lower tax rates, special write-offs and depreciation schedules; outright grants or low-cost loans may be offered to the prospective investor, or the host country government may seemingly lessen the firm's risk of investing in that country by giving guarantees and assurances with respect to the repatriation of capital and loan funds as well as profits and interest.

In some cases, either arising from its balance-of-payments situation, showing considerable accumulation of foreign currency reserves, or because of foreign aid policies, the home country government may provide incentives to invest abroad.[8]

Certain of the home government's domestic policies or the general
political and economic climate at home may force the firm to shift some of
new production capacity abroad.[9]

International political developments may also affect a firm's
decision to invest abroad.[10]

Implications

If the foreign corporation enjoys some advantages over local
enterprises, it would normally not be inclined to share its equity in the
foreign venture with local interests, because this would mean giving up
a portion of this scarce advantage. Most firms do in fact maintain
wholly-owned subsidiaries abroad, although a trend toward less than one
hundred percent ownership appears to emerge. Some firms feel that for
political and economic reasons it may be prudent to give up some minority
portion of the advantage over which they have control; these firms do,
however, in most cases insist upon owning the controlling interest in
the venture. In situations where partners are fairly equal in the advantages
controlled,[11] fifty-fifty joint ventures or even minority participation
with domestic, powerful local, or third country firms may be established.[12]

Since most foreign investors are fairly large oligopolistic
enterprises, small firms would have difficulties entering into foreign
countries because of a lack of the advantages that large firms are endowed
with. There are, however, exceptions; sometimes small firms, particularly
inventor-owned enterprises manufacturing unique or specialty products, are
able to operate in foreign markets and to succeed due to their technological
advantage alone. Generally, however, small firms, because of their lack
of expertise and probably due to exaggerated risk assessments of foreign
investment opportunities, tend to be unable or unwilling to even consider
foreign investment.[13]

A further implication of the oligopolistic investment theory was pointed out by Kindleberger,[14] who suggested that oligopolists maintaining large-scale and efficient operations actually widen rather than restrict competition; their prices and costs are lower than those of small and inefficient local producers which are often operating in a protected environment. An exception to this implication may, however, be the infant-industry argument which contends that small local producers must be protected during the early stages of their existence in order to provide them with a chance to develop into efficient and internationally competitive enterprises.

Finally, there are some implications for prospective host countries. If the individual country represents a sizeable and important market for any firm, its government can, through incentives and/or penalties, force the firm to substitute local manufacture for exports. It is unlikely that the firm will simply abandon the market position it already has established in that country through exporting, because the local government through various fiscal, trade or financial measures makes it more difficult for the firm to service that market through exports.[15]

If the individual market is sufficently important to the foreign firm, and if political risks are not overly high due to relative stability in government, the host country government could be in a good position to demand that local interests be given the opportunity to acquire at least some equity interest in the affiliate to be established. Such a measure would at least ease some of the negative aspects of foreign ownership.[16]

[1] Kindleberger, in op. cit. pp. 1-36. Richard E. Caves, "International Corporations: The Industrial Economies of Foreign Investment" reprinted in: John Dunning (ed.) International Investment, Penguin, Harmondsworth (England), 1972.

[2]Caves, in op. cit. pp. 265-266.

[3]Kindleberger, in op. cit. p. 19.

[4]particularly Algeria, Iran, Iraq, Libya, Saudi Arabia and Venezuela.

[5]This was expressed by measures of expropriation, increased royalties and export taxes, and reduced production quotas. The Arabian American Oil Company (ARAMCO) is a striking example of governmental interference in corporate affairs culminating in the recent announcement of the government of Saudi Arabia that it intends to acquire control of this the world's largest crude oil produce.

[6]Such suspicions were raised by the media, during Senate hearings in Washington, D.C., and during parliamentary debates in the Bundestag in Bonn.

[7]European and Japanese steel and non-ferrous metals companies are prime examples for this type of investment behaviour.

[8]Some of these measures will be discussed in greater detail in Chapter Five below.

[9]See footnote No. 8 above.

[10]Several smaller, privately-owned European firms invested in North and South America and South Africa during the immediate post-war period, because they feared that eventually communism may spread into Western Europe threatening their wealth.

[11]For example two chemical companies of similar size and technological sophistication.

[12]For an in depth discussion see: J.W.C. Tomlinson, The Joint Venture Process in International Business: India and Pakistan. M.I.T. Press, Cambridge (Mass.), 1970.

[13]Planungsgruppe Ritter, Transfer von Technologie in Entwicklungslaender Koenigstein, Taunus (Germany), 1973.

[14]Kindleberger, in op. cit. pp. 31-33.

[15]Brazil appears to have been highly successful in attracting foreign investors which may have been partly due to that country's government having imposed import restrictions, local-content rules and other measures inhibiting the inflow of foreign products, coupled with generous export incentives.

[16]Melville Watkins, Foreign Ownership and the Structure of Canadian Industry. Information Canada, Ottawa, 1968.

CHAPTER FOUR

CORPORATE CHARACTERISTICS AND ENTRY
CONCENTRATION BY INDUSTRY

This Chapter investigates and tests possible relationships between various corporate and market characteristics, indicating oligopolistic conditions, and oligopolistic foreign investment behaviour expressed by Entry Concentration Indices. Thus this and the following chapter attempt to prove the validity of the hypothesis which was formed at the outset of this thesis.

Non-parametric rank order correlation techniques were used for the purpose of testing the degrees of association between the variables. This was necessary, because the data are not continuous and thus do not represent interval scales. The classical Pearson correlation method requires that assumptions such as normality of parent distributions and homogeneity of variances be made. However, where the data represent ranks or qualities rather than real numerical properties, rank order correlation conveys more reliable results.[1]

Spearman's and Kendall's techniques of measuring degrees of linear association were used. Although both measures, Spearman's r and Kendall's tau, are good estimates of the degree of association between variables when small samples are tested, Kendall's tau is considered to be more reliable in large-sample situations.[2]

Oligopolistic Conditions in Factor Markets

According to Caves and Kindleberger[3] imperfect competition in markets for the factors of production, particularly capital, technology and management, is an important motivation for firms to invest abroad because of the advantage they enjoy over the generally smaller and less powerful local enterprises. This section attempts to relate Entry Concentration,

a measure of oligopolistic investment behaviour, to degrees of oligopoly in the firms' input markets.

Size of the Firm

It was assumed that size in itself represents relative degrees of oligopoly. Thus it was postulated that, as the firm increases in size, its influence over a limited domestic market increases, and it thus reaches the status of an oligopolist. A cut-off value cannot readily be found, because a certain size that would constitute oligopoly in one industry could mean near perfect competition in large sectors. It can, however, be safely assumed that firms whose assets exceed $100 million and firms employing in excess of 25,000 people are oligopolists or monopolists in some cases.

Size is measured in terms of total assets and total number of employees; these figures were broken down into domestic and international operations.

The results of the correlations of financial data with Entry Concentration Indices are presented in Table 4-1:

TABLE 4-1

Coefficients of Correlation of IECIs* with Total Assets

	Total Domestic Assets (n=30)		Total Assets Abroad (n=24)	
	Spearman's r	Kendall's tau	Spearman's r	Kendall's tau
3-year IECI	-0.2082(0.135)*	-0.1863(0.074)	-0.0329(0.439)	-0.0314(0.415)
5-year IECI	-0.1852(0.164)	-0.1680(0.096)	-0.0440(0.419)	-0.0396(0.393)
7-year IECI	-0.1852(0.164)	-0.1680(0.096)	-0.0440(0.419)	-0.0396(0.393)
10-year IECI	-0.0489(0.399)	-0.0465(0.359)	-0.0573(0.395)	-0.0515(0.362)
Average IECI	-0.2626(0.080)	-0.2338(0.035)	0.0936(0.332)	-0.0768(0.299)

*IECI stands for 'Industry Entry Concentration Index.'

**In this and all of the following statistical tables, the result of the normal one-tailed test for statistical significance is reported in parentheses after each coefficient.

The correlation results presented above appear to contradict the hypothesis that the larger firms display oligopolistic investment behaviour. The negative relationship between IECIs and total domestic assets would rather suggest that the larger firms do not necessarily undertake defensive investments to any great extent. These correlation results should, however, be put into proper perspective by relating them to some of the sample's characteristics. Firstly, information pertaining to asset figures covers only thirty situations in the case of domestic assets, and twenty-four firms reported foreign assets, while information on thirteen and nineteen cases respectively was missing. Secondly, a large majority of the respondent firms[4] actually had assets in excess of $100 million which would suggest that the somewhat smaller firms, which are still considered to be oligopolists in terms of size, display more defensive investment behaviour. Chemical firms account for a significant portion of the largest firms contained in the sample, and IECI values for the chemical industry are somewhat lower than those of other industry groups.[5]

Size was also measured in terms of number of people employed by the firm, on the premise that the greater the number of people drawn from a limited labour market and employed by the firm, the greater the firm's degree of oligopoly. Since the pool of available labour at home is limited, firms already employing large numbers of people are unable to expand their domestic labour forces significantly, and they are thus forced to export large amounts of capital to countries whose labour supply is rather abundant.

The German and Swiss industries are good examples of this situation. Persistent domestic labour shortages forced German firms to begin importing foreign workers during the late 1950's in order to fill vacant jobs. By the early 1970's the foreign labour population in Germany had approached three million, resulting in social problems. Prejudices and suspicions toward the foreigners have developed among Germans, and foreign workers had

difficulties in integrating into German society resulting in various ethnic ghettos. An already existing housing shortage, rooted in the destruction during World War II and the population shifts during the immediate post-war period, was further aggravated by the influx of foreigners into Germany. Recently political unrest has been growing among foreign workers who demand more rights in union, corporate and community affairs. The dissatisfied foreign worker has recently become a fertile recruiting ground for the German Communist Party which has had difficulties in gaining acceptance by the German working class.[6]

In Switzerland public sentiments against further growth of the foreign labour force ran high forcing the Swiss government to adopt measures restricting immigration, as decribed in Chapter Five below.

German and Swiss firms have had to respond quickly by establishing manufacturing operations abroad.[7]

Oligopolists would then tend to rival each other in investing in those capital-poor but labour-abundant regions. This is particularly evident among those German, Dutch and Swiss firms which are unable to expand their domestic production units mainly due to the general unavailability of labour.[8]

The results of the correlations between IECIs and employment data are presented in Table 4-2.

TABLE 4-2

Coefficients of Correlation of IECIs with Total Employees

	Domestic Employees (n=41)		Employees Abroad (n=41)	
	Spearman's r	Kendall's tau	Spearman's r	Kendall's tau
3-year IECI	0.0005(0.499)	-0.0081(0.470)	-0.0034(0.491)	-0.0033(0.488)
5-year IECI	0.0535(0.370)	0.0441(0.342)	0.0336(0.417)	0.0282(0.398)
7-year IECI	0.0535(0.370)	0.0441(0.342)	0.0336(0.417)	0.0282(0.398)
10-year IECI	0.2071(0.097)	0.1841(0.045)	0.1352(0.200)	0.1229(0.129)
Average IECI	-0.0474(0.384)	-0.0467(0.333)	0.1156(0.236)	0.0888(0.207)

The above results were rather insignificant and the correlation coefficients had rather low values. However, these values were mainly positive, and they thus indicate at least the direction of the association which would tend to lend some slight support to the hypothesis, particularly when ten-year IECIs are taken into consideration.

Because the linear correlation results were rather weak and insignificant, the assumption of linearity was dropped, and tests for non-linear associations were conducted in the form of crosstabulations. These tests basically confirmed the correlation results in that significant non-linear relationships could not be established. The CHI-squared values these tests produced were insignificant, they consistently and considerably exceeded the five percent cut-off level of statistical significance.

Cost and Availability of Capital

Entry Concentration Indices were also correlated with the more qualitative results pertaining to the individual respondents' assessments of the importance of the availability and cost of capital to the foreign investment decision.

The extent to which lack of capital had an important restraining or preventitive influence on the sample's foreign investment decision, and to what degree these data are associated with the levels of entry concentration is shown by Table 4-3.

TABLE 4-3

Coefficients of Correlation of IECIs with
Importance of Lack of Capital

	Importance of Lack of Capital to the Foreign Investment Decision (n=42)	
	Spearman's r	Kendall's tau
3-year IECI	-0.1245(0.216)	-0.1066(0.160)
5-year IECI	-0.1210(0.223)	-0.1084(0.156)
7-year IECI	-0.1210(0.223)	-0.1084(0.156)
10-year IECI	-0.0727(0.324)	-0.0674(0.265)
Average IECI	-0.2117(0.089)	-0.1818(0.045)

Although these are not highly significant, probably due to the fairly small sample size, they did, however, consistently indicate at least the direction of the association. Thus, the results, however weak, would tend to suggest that generally firms amply endowed with capital resources or with the capacity of raising additional capital tend to concentrate their entries into foreign markets.

The rather low values of the correlation coefficients in this test could, to some extent, be due to the composition of the sample. Almost one-half of the sample, particularly firms in Austria, Germany and to a lesser degree in Belgium and France, had suffered from repeated shortages of capital after World War I and particularly after World War II when their domestic operations were extensively damaged or destroyed entirely.[9] Whatever small amounts of capital were available to these firms had to be used for

reconstruction and re-establishment of their previous domestic market positions. Thus the unique experiences of these firms may have somewhat biased the results of this test.

The importance of the availability of capital in relationship to entry concentration was further tested through the use of decision data covering some 363 individual subsidiaries. European corporate executives provided information on the level of importance to individual investment decisions attached to the availability of surplus funds in the parent firm for investment domestically or elsewhere. The correlation results are displayed in Table 4-4.

TABLE 4-4

Coefficients of Correlation of ECIs with
Importance of Surplus Funds Available

| | Importance of Surplus Funds Available (n=363) | |
	Spearman's r	Kendall's tau
3-year ECI	-0.1161(0.013)	-0.0835(0.009)
5-year ECI	-0.0386(0.232)	-0.0422(0.115)
7-year ECI	0.0113(0.415)	0.0064(0.428)
10-year ECI	0.0334(0.263)	0.0226(0.260)
Average ECI	0.0113(0.415)	0.0064(0.428)

Obviously the results of the above test were such that no relation-ship in either direction could be established. This would suggest that the availability of surplus funds in the parent firm was not associated with the degrees of entry concentration. The importance of the availability of surplus capital was generally considered by the respondents to be secondary to the foreign investment decision, meaning that firms did not keep substantial surplus funds on hand for the purpose of grasping possible investment

opportunities. Corporations would tend to synchronize their liquid funds to their working capital requirements and to re-invest surpluses in production operations rather than holding excessively large amounts of funds in relatively low-yield short-term securities.

Data assessing the importance of the cost of domestic capital relative to that of funds raised abroad to the respondents' foreign investment decisions were also correlated with the Entry Concentration Indices. The correlation results of this test are shown in Table 4-5.

TABLE 4-5

Coefficients of Correlation of IECIs with
Importance of Costs of Capital

| | Importance of Relative Costs of Capital to the Foreign Investment Decision (n=41) | |
	Spearman's r	Kendall's tau
3-year IECI	0.1833(0.126)	0.1541(0.078)
5-year IECI	0.1294(0.210)	0.1146(0.146)
7-year IECI	0.1294(0.210)	0.1146(0.146)
10-year IECI	0.0694(0.333)	0.0656(0.273)
Average IECI	0.2969(0.030)	0.2567(0.009)

Although these results display rather weak and insignificant degrees of linear association between the variables at least a consistently positive direction has again been established. This would suggest that as the importance of relative costs of capital increases, this would coincide with generally higher degrees of entry concentration. These results must, however, be qualified. Relative costs of capital when considered, were not regarded as one of the more important factors in the firms' overall foreign investment decision process. The respondents generally stated that the importance of this factor was rather secondary to the overall foreign investment decisions in individual cases.

Level of Technology

Technological superiority of the foreign investor is an important part of the oligopolistic foreign investment theory.[10] In this section, the attempt is made to test the hypothesis that firms with command over advanced and sophisticated technology tend to rival each other in entering into foreign markets and establishing production units. Several variables were correlated with Entry Concentration Indices. "Research and Development Expenditures" was the only quantitative variable but the most important one used for testing the validity of the hypothesis. In the absence of other measures which could stand for a firm's or industry's level of technological sophistication, R & D expenditures were used on the premise that there is a direct and positive relationship between the level of R & D expenditures and the firm's technological advancement. Thus it was assumed that firms, which spend relatively large portions of their revenue dollars on Research and Development, have control over sophisticated know-how and technology; these firms also tend to be leaders in innovation.[11]

Research and development expenditures were broken down into two categories:

> Domestic R & D expenditures as a percentage of domestic production, and
> The percentage of foreign production spent on R & D abroad.

At the outset raw R & D and IECI values were correlated with the use of Pearson's Parametric technique. Information on the levels of domestic R & D expenditures was obtained from only thirty-three respondents, while merely sixteen firms revealed their expenditures on Research and Development abroad. The results of this test are presented in Table 4-6.

TABLE 4-6

Coefficents of Correlations of IECIs with
R & D Expenditures

| | Pearson Correlation Coefficients | |
	Domestic R & D Expenditures (n=33)	R & D Expenditures Abroad (n=16)
3-year IECI	0.2106(0.120)	-0.2795(0.147)
5-year IECI	0.0914(0.307)	-0.3961(0.064)
7-year IECI	0.1915(0.143)	-0.2589(0.166)
10-year IECI	0.1969(0.136)	-0.3275(0.108)
Average IECI	0.1725(0.169)	-0.3363(0.101)

This test shows rather weak positive but generally insignificant linear relationships between domestic R & D expenditures and degrees of Entry Concentration. The Pearson coefficients of correlation of R & D expenditures abroad and Entry Concentration Indices had somewhat higher and negative values, but the levels of significance were quite unsatisfactory which was probably due to the small size of the sample. The direction, however, indicated by this initial test would appear to be in keeping with the hypothesis, because the results suggest that firms spending larger percentages of their domestic revenues on R & D tended to concentrate their foreign investments, while higher levels of R & D spending abroad would coincide with smaller degrees of entry concentration. This negative relationship between IECIs and R & D expenditures abroad appears to re-inforce the argument that oligopolists tend to concentrate their research and development effort in the home country. R & D is viewed as being more efficient if centralized at the main plant or at headquarters. Centralized R & D can be better administered and geared to production requirements than R & D that takes place in various locations at home and

abroad.[12] It may also be argued that undertaking R & D almost exclusively at home and 'exporting' to rather than 'producing' this technological advantage in foreign countries would mean added protection of the firm's know-how and technology.

Because of the possible problems associated with the Pearson correlation when used for this type of study, the relationship between the variables was tested with the use of Kendall's and Spearman's non-parametric correlation technique which was discussed at the outset of this chapter.[13] At first the raw R & D and ECI data were correlated, and the results of this test are shown in Table 4-7.

TABLE 4-7

Coefficients of Correlation of IECIs with
R & D Expenditures

	Domestic R & D Expenditures (n=33)		R & D Expenditures Abroad (n=16)	
	Spearman's r	Kendall's tau	Spearman's r	Kendall's tau
3-year IECI	0.3641(0.019)	0.2714(0.013)	-0.1309(0.315)	-0.1272(0.246)
5-year IECI	0.1099(0.271)	0.0748(0.270)	-0.3427(0.097)	-0.2447(0.094)
7-year IECI	0.3641(0.019)	0.2714(0.013)	-0.1309(0.315)	-0.1272(0.246)
10-year IECI	0.3603(0.020)	0.2800(0.011)	-0.1495(0.290)	-0.1272(0.246)
Average IECI	0.3641(0.019)	0.2714(0.013)	-0.1309(0.315)	-0.1272(0.246)

This non-parametric test of association produced improved results which were particularly significant for domestic R & D expenditures. The correlation coefficients of IECIs and R & D expenditures abroad remained fairly low, and the level of significance was considerably above the generally acceptable five percent cut-off. The direction of the relationship, however, remained the same as shown by the Pearson test, being positive for domestic research and development expenditures and negative for research and development expenditures abroad.

In order to further check the relationship between R & D expenditures and IECIs, the R & D and IECI data were re-arranged into pre-defined value ranges, and those new data were then entered into a non-parametric test the results of which are given by Table 4-8.

TABLE 4-8

Coefficients of Correlation of IECIs with
R & D Expenditures (ranges)

	Domestic R & D Expenditures (n=33)		R & D Expenditures Abroad (n=16)	
	Spearman's r	Kendall's tau	Spearman's r	Kendall's tau
3-year IECI	0.1884(0.147)	0.1431(0.121)	-0.2814(0.145)	-0.2532(0.086)
5-year IECI	0.1970(0.136)	0.1658(0.087)	-0.2890(0.139)	-0.2728(0.070)
7-year IECI	0.1970(0.136)	0.1658(0.087)	-0.2890(0.139)	-0.2728(0.070)
10-year IECI	0.1529(0.1980)	0.1378(0.130)	-0.1714(0.263)	-0.1618(0.191)
Average IECI	0.2803(0.057)	0.2284(0.031)	-0.0313(0.454)	-0.0319(0.432)

These latter results were significantly inferior to those of the previous test, and thus re-arranging the data did not result in an improvement of either value of the correlation coefficients or the significance levels.

Despite the rather weak, but nevertheless significant, degree of association between the levels of research and development spending and entry concentration, as shown particularly in Table 4-7, the hypothesis appears to have been substantiated. Thus there seems to be a positive link between high levels of R & D expenditures at home which indicate high levels of technological sophistication, and a high degree of entry concentration which suggests oligopolistic investment behaviour.

These results of correlating R & D expenditures with ECIs appear to contradict Knickerbocker's findings.[14] Knickerbocker concluded that highly R & D-oriented industries either do not undertake defensive investments, or they time their foreign investments differently from industries with lower levels of R & D efforts. This study, however, reaches the opposite conclusion, probably because somewhat different data were used. While Knickerbocker conducted his tests with the use of average R & D expenditures of twelve industries, in this study individual corporation data were used. Thus the correlation results may express somewhat better the rivalry of individual firms within the industry groups. This phenomenon does not appear to have been reflected in Knickerbocker's results.

In order to test the technology issue further and to re-inforce the findings arrived at thus far, it was decided to test the degrees of association between Entry Concentration Indices and a set of qualitative data pertaining to the respondents' attitudes toward the issue of licensing as a possible alternative to foreign direct investment, and to the importance of utilizing the firms' know-how and technology when the investment decision was made.

Some significant results were obtained when the importance of technological factors upon the decision not to license were related to Entry Concentration Indices. These factors were the individual firms' concern for secrecy, and the fact that technology was considered to be an integral part of an indivisible corporate package. The correlation results are presented in Tables 4-9 and 4-10 below.

TABLE 4-9

Coefficients of Correlation of IECIs with the Degree
to which Concern for Secrecy Inhibits Licensing Arrangements
(n=41)

	Spearman's r	Kendall's tau
3-year IECI	0.2829(0.037)	0.2601(0.008)
5-year IECI	0.2749(0.041)	0.2489(0.011)
7-year IECI	0.2749(0.041)	0.2489(0.011)
10-year IECI	0.1677(0.147)	0.1524(0.080)
Average IECI	0.2830(0.037)	0.2584(0.009)

TABLE 4-10

Coefficients of Correlation of IECIs with the Degree
to which Indivisible Technology Inhibits Licensing Arrangements
(n=41)

	Spearman's r	Kendall's tau
3-year IECI	0.2434(0.063)	0.2136(0.025)
5-year IECI	0.2538(0.055)	0.2281(0.018)
7-year IECI	0.2538(0.055)	0.2281(0.018)
10-year IECI	0.2129(0.091)	0.1941(0.037)
Average IECI	0.3029(0.027)	0.2657(0.007)

The above results tend to re-inforce the results of the earlier correlations of the Entry Concentration Indices with the levels of research and development expenditures of the European firms. The greater the concern for secrecy and the more important the firms' assessment of their technology as being part of an indivisible package, the greater the degree of entry concentration. Licensing as an alternative to foreign direct investment will be discussed briefly below.

Because of a lack of data, it was not possible to conduct a quantitative analysis establishing possible relationships between the number of patents the individual firms own and the degrees of entry concentration by industry. Most of the respondents could not state nearly exact figures pertaining to patents held, but most of the sample firms, particularly those in the science and technology-based industries command substantial patented know-how.

Qualitative information was received on the importance upon the foreign investment decision of utilizing patents and know-how in individual situations. These data were correlated with the Entry Concentration Indices and the results are presented in Table 4-11.

TABLE 4-11

Coefficients of Correlation of IECIs with
Importance of Using Patents

	Importance of Using Patents and Know-How upon the Investment Decision (n=363)	
	Spearman's r	Kendall's tau
3-year IECI	0.0780(0.069)	0.0637(0.035)
5-year IECI	0.0745(0.078)	0.0595(0.045)
7-year IECI	0.1417(0.003)	0.1176(0.001)
10-year IECI	0.1005(0.028)	0.0784(0.013)
Average IECI	0.1417(0.003)	0.1176(0.001)

These results, although being generally significant, did not reveal any meaningful linear relationship between the two variables. There was, however, at least some consistency in the direction of the association, and this would suggest, however weak the relationship, that the more important it is for the firms, when considering foreign investment, to make use of their technology or patents, the more concentrated their entries into foreign markets would tend to be.

The evidence thus far presented appears to verify the hypothesis which states that superiority in technology tends to be an important force in motivating firms to rival each other in establishing manufacturing subsidiaries abroad.

Calibre of Management

In this section the attempt is made to test the hypothesis which states that oligopolists drawing on a pool of highly efficient management personnel are also firms that are the dominant foreign investors.

Generally the sample firms, merely because of their size and relative importance, have the resources for attracting and maintaining highly efficient management personnel. This is also reflected by the historically strong growth rates enjoyed by virtually all of the European firms surveyed.

Workable quantitative variables expressing superiority in management calibre were not available. Thus data obtained on two qualitative decision factors were correlated with industry ECIs.

Superior Management Available to the Parent Firm

European corporate executives were asked to assess the importance upon individual investment decisions of having the managerial facilities available to operate potential foreign operations. The answers were given numerical values representing the degrees of importance attached to this factor in individual situations. These values were correlated with the Entry Concentration Indices, and the results of this test are presented in Table 4-12.

TABLE 4-12

Coefficients of Correlations of IECIs with
Importance of Available Management
(n=363)

	Spearman's r	Kendall's tau
3-year IECI	0.0829(0.057)	0.0741(0.018)
5-year IECI	0.1627(0.001)	0.1308(0.001)
7-year IECI	0.1197(0.011)	0.1070(0.001)
10-year IECI	0.0660(0.105)	0.0568(0.053)
Average IECI	0.1197(0.011)	0.1070(0.001)

The above results, although consistently significant in statistical terms, failed to show any convincing relationship among the variables. However, the fact that the correlation coefficients were consistently positive could at least give an indication of the direction of the degree of association. One probable reason for the rather weak relationships produced by this test may be that the importance, attached to available management resources, was generally viewed by the respondents as having been rather secondary. The availability of home country nationals who could manage potential foreign operations was generally not a prime criterion for the decision to invest in individual countries. Furthermore the data included decisions to invest in industrially advanced countries as well as in less developed nations. Personal interviews with company executives revealed that available parent company management played a more important role in the decision to invest in those latter countries. Thus the hypothesis could still be considered as having been verified although perhaps not very convincingly.

Importance of the Availability of Local Management

Weights of importance attached to this investment criterion by the respondents were correlated with Entry Concentration data. This test was conducted with the purpose of supporting and re-inforcing the superior-management-calibre argument tested above. The correlation results are presented in Table 4-13.

TABLE 4-13

Coefficients of Correlation of IECIs with
Importance of Locally Available Management
(n=363)

	Spearman's r	Kendall's tau
3-year IECI	0.1961(0.001)	0.1741(0.001)
5-year IECI	0.0224(0.358)	0.0191(0.320)
7-year IECI	-0.0975(0.032)	-0.0810(0.011)
10-year IECI	-0.1117(0.017)	-0.0924(0.004)
Average IECI	-0.0975(0.032)	-0.0810(0.011)

These results were rather inconclusive, as they did not present any consistent degree of association in either direction. The quality and availability of local management was not an overriding issue in the firms' foreign investment decision. Initially virtually all of the firms' foreign subsidiaries were established and managed by personnel sent from the corporate headquarters to the host country. After the subsidiaries' operations had reached their target levels of performance, local personnel were trained to assume middle or higher-level management responsibilities, and parent country nationals returned to headquarters or were sent to establish new operations in other countries. Thus the availability of local management personnel did not materially affect the respondent firms' foreign investment decisions.

Although the tests conducted in the above section produced rather weak and seemingly inconclusive results, the superior-management hypothesis should not be rejected solely on the basis of these findings. Better supporting evidence, preferably different and more quantitative data, could conceivably yield results that are of significantly improved quality.

Oligopolistic Conditions in Product Markets

Very little empirical evidence in the form of quantitative data was obtained which could cover this aspect of oligopoly. Some of the areas investigated were described by such intangible and immeasurable variables as quality and product differentiation; other areas such as market control and economies of scale had to be dealt with rather descriptively because of only a few supporting quantitative data available. Nevertheless the attempt is made to at least conceptually link oligopolies in output markets to oligopolistic investment behaviour. The results of this section appear to be impressionistic rather than well-established empirical facts.

Differentiation and Quality of Products

It could be suggested that advertising expenditures be used as a reliable measure of the degree of product differentiation. Knickerbocker[15] in fact used advertising expenditures as independent variables in one of the tests conducted. He does, however, express his doubts about the validity of his results.

Advertising expenditures may only in part reliably represent relative degrees of product differentiation. Particularly when applied to consumer goods sectors such as food, clothing, detergents, cosmetics and household appliances extensive advertising could adequately reflect product differentiation. This is in part due to an inherent bias in using advertising

expenditures as independent variables, because the higher degrees of differentiation are associated with higher levels of expenditures which may mainly be the result of choosing the media through which the products are advertised. This would then suggest that products advertised through the much more expensive mode of radio and television commercials would be more differentiated than products advertised in other media. This conclusion does not necessarily fit all consumer durable goods or products used for industrial purposes. While, for example, many automobile companies advertise their products on radio and television, there are some notable exceptions. Several European automobile manufacturers, whose products are highly differentiated, do not engage in extensive advertising, and they are conspicuously absent from radio and television advertising. Their products are mainly advertised in specially selected journals and newspapers and through the firms' own promotional literature. These firms in fact differentiate their products by not advertising them in the mass media, because they want to address only a selected market segment.[16] Using advertising expenditures would also result in classifying the pharmaceutical industry as not being highly differentiated although the opposite is true. Due to government regulation in most countries the pharmaceutical industry is not permitted to advertise prescription drugs to any significant extent; these, however account for an important portion of those firms' business.

It would be similarly problematic to define and to establish a reliable measure of quality. One suggestion might be to simply use durability; this could be fairly easily determined for some products, such as machinery, automobiles and electrical equipment by determining the average life span of the product. Such a measure would, however, only present part of the picture. In other industrial sectors it would be much more difficult to establish quantitative measures of relative qualities which could be useful for this type of study. For example to arrive at useful quality measures for chemicals

and particularly for pharmaceuticals would be an arduous task, and the results of such an undertaking. would probably still be fairly arbitary.

Thus because of the inherent difficulties in establishing reliable measures of product differentiation and quality which could be useful and meaningful to this study, and because of the lack of adequate data covering this area, a rather impressionistic and conceptual approach was chosen for the purpose of analysing the degree of oligopoly in these aspects of product markets.

Most of the sample firms were old and well-established corporations. Only one firm was founded after World War II, and a few additional companies had their origins during the inter-war period. The majority of the respondent firms came into being during the period from 1850 to 1913. The latter were primarily chemical firms, some automobile companies, and most of the machinery and electrical equipment producers. Some firms traced their origins even further back in history.[17]

Virtually all of the firms surveyed, or their products, are well-known in Europe, and most of these are prominent in world markets. Thus long-established and well-known company names or products by themselves may create a significant degree of product differentiation, and age of the firm and its resulting prestige can often result in being associated with quality.

Many of the respondent firms were actual pioneers in the development of the products they still manufacture and continue to refine and to perfect.[18] Having been product pioneers many of those firms were the first to become internationally active during the late nineteenth century. A few of those companies operated foreign subsidiaries almost immediately after they were established. These were mainly firms which manufactured products that could not be exported efficiently or in significant quantities, either because of their weight, bulk or low price,[19] or because other factors inhibiting exports such as the need for servicing a complex product or because of customer demands.[20]

Other product pioneers did not feel the need to manufacture their products abroad until after the Second World War, either because they were still in the process of achieving sufficient growth and market control domestically, or because their products, being made in the home country, enjoyed greater prestige and reputation for quality than similar products made locally.

Along with the well-differentiated corporation names, the products of the sample firms have been generally highly differentiated.

All of the firms deal in branded products which are well-known through effective advertising, and most of these products enjoy a reputation of having a high level of quality, durability and efficiency.[21]

Market Control and Entry Concentration

In this section the attempt is made to test the hypothesis that firms already having extensive control over the domestic market cannot materially increase their market shares without disrupting industry stability and provoking destructive price wars.[22] In order to maintain their desired growth rates and an 'orderly market' those firms are forced to expand abroad.[23]

As a start possible relationships between entry concentration and domestic production were tested. This was done on the premise that the amount of domestic production dollars may provide at least some weak indication of the firms' power in their domestic markets. At first raw domestic production values were correlated with Entry Concentration Indices, and the results of this test are presented in Table 4-14.

TABLE 4-14

Coefficients of Correlation of IECIs and Domestic Production
(n=38)

	Pearson's r
3-year IECI	0.1180(0.240)
5-year IECI	0.2744(0.048)
7-year IECI	0.1559(0.175)
10-year IECI	0.2367(0.076)
Average IECI	0.1968(0.118)

These results, though by no means highly significant in statistical terms, appear to point into the direction indicated by the oligopolistic competition theory, and they appear to verify at least partially, in statistical terms impressions conveyed in discussions with individual executives.

An attempt was made to improve the above results; production figures and IECI values were classified into ranges which were then correlated through the use of non-parametric techniques. The results of this correlation are shown in Table 4-15 below.

TABLE 4-15

Coefficients of Correlation of IECIs with Domestic Production
(n=40)

	Spearman's r	Kendall's tau
3-year IECI	0.0021(0.495)	0.0000(0.500)
5-year IECI	0.0699(0.334)	0.0608(0.290)
7-year IECI	0.0699(0.334)	0.0608(0.290)
10-year IECI	0.2651(0.051)	0.2507(0.011)
Average IECI	-0.0407(0.410)	-0.0391(0.361)

These results were rather disappointingly inferior to those obtained by the initial parametric correlation test. Thus the latter results convey a better picture of the positive relationship between domestic production and entry concentration than the results of the non-parametric tests.

The relationship between the firms' influence over their domestic markets and the concentration of their entries into foreign markets was further tested by correlating domestic market shares of the firms' individual product lines with Entry Concentration Indices. The results of this test are shown in Table 4-16.

TABLE 4-16

Coefficients of Correlation of IECIs with
Domestic Market Shares
(n=64)

	Spearman's r	Kendall's tau
3-year IECI	0.2305(0.033)	0.1923(0.012)
5-year IECI	0.2630(0.018)	0.2276(0.004)
7-year IECI	0.2630(0.018)	0.2276(0.004)
10-year IECI	0.2914(0.010)	0.2612(0.001)
Average IECI	-0.0198(0.438)	-0.0165(0.424)

These results were statistically significant to a considerable degree. Although the values of the correlation coefficients were rather low, indicating weak linear relationships, this test reinforces the argument that firms whose products have captured significant portions of the domestic market, tend to rush into foreign markets for further expansion and growth. Thus an important part of the oligopolistic investment theory, dealing with patterns of control over product markets, can be accepted as having been verified.

Economies of Scale

Internal and external economies of scale are considered by Caves and Kindleberger[24] to be important factors of oligopolistic investment behaviour. This section of the study constitutes an attempt to verify this contention.

The general first impression from the personal interviews conducted would suggest that internal economies of scale appeared to play more important roles than external economies which were important only in the case of a few firms of the metal industry.

As Table 4-1, 4-2 and 4-15 above displayed, an earlier attempt to correlate various overall size measures with Entry Concentration Indices did not produce statistically significant and useful results.[25] Because data describing overall international commitment are not necessarily adequate indicators of economies of scale -- they do not reflect the sizes of individual production units -- data on individual foreign subsidiaries were correlated with Entry Concentration Indices. This test was conducted for the purpose of determining the extent to which there exists a relation- ship between entry concentration and the scale of the production unit. The oligopolistic investment theory would suggest that such a relationship should be positive, meaning that rivalry among oligopolists grows fiercer with an increase in the feasible scale of the individual operation. The results of this test are presented in Table 4-17.

TABLE 4-17

Coefficients of Correlation of IECIs with
Size of Foreign Subsidiaries

Pearson's r

	Total Revenue (n=108)	Total Assets (n=11)	Shareholders' Equity (n=214)
3-year IECI	0.1563(0.053)	0.7038(0.008)	0.0050(0.471)
5-year IECI	0.1600(0.049)	0.1965(0.281)	0.0046(0.473)
7-year IECI	0.1561(0.053)	0.7394(0.005)	0.0257(0.354)
10-year IECI	0.1632(0.046)	0.0118(0.486)	-0.0102(0.441)
Average IECI	0.1596(0.050)	0.4770(0.069)	0.0080(0.454)

These results show rather consistently positive and mainly significant positive relationships between Entry Concentration Indices and revenues and assets of individual foreign subsidiaries of the respondent firms. The rather high coefficient values of the correlation of IECIs (particularly 3-year and 7-year IECIs) with subsidiary assets must, however, be accepted with some caution. Only a few firms made asset figures of their subsidiaries available, and thus the sample size of this test is so small that it may not be representative from a purely statistical point of view. Furthermore most of these asset figures obtained were those of foreign affiliates of automobile and electrical equipment producers which have some large-scale operations abroad, and their IECIs have high values. Thus to values of the coefficients of the correlations with 3-year and 7-year IECIs are rather unusual and special cases. Thus had the sample been larger, different, probably lower, coefficient values could have resulted. It may, however, be doubtful that in such a case the direction of the established association would change.

The relationship between ECIs and equity capital employed in the various foreign subsidiaries is rather inconclusive and statistically insignificant. This could mean that parent firms generally try to minimize their equity commitment regardless of the degree of entry rivalry.

An attempt was made to determine the extent to which external economies which usually result in vertical integration, are related to the degree of entry concentration. Quantitative data were not available, and only one variable weighted qualitatively expressing the relative importance upon individual investment decisions of obtaining raw materials and components was used. As almost expected, the results of correlating these data with ECIs were of rather dubious quality as can be seen in Table 4-18.

TABLE 4-18

Coefficients of Correlation of IECIs with
Importance of Raw Material Sources
(n=363)

	Spearman's r	Kendall's tau
3-year IECI	0.2031(0.001)	0.1571(0.001)
5-year IECI	0.0179(0.367)	0.0138(0.348)
7-year IECI	-0.2332(0.001)	-0.1962(0.001)
10-year IECI	-0.2547(0.001)	-0.2162(0.001)
Average IECI	-0.2332(0.001)	-0.1962(0.001)

Firms that made investment decisions on the basis of obtaining raw materials were mainly metal producers and thus represented a rather small proportion of the overall sample. For these firms developing and securing raw material sources and ensuring continuous supply by maintaining an equity position in metals and coal mines abroad was vitally important for the operation and success of their domestic operations. These firms

were mainly steel and non-ferrous metals producers of raw material-poor
countries such as Austria, Belgium, Germany, Netherlands and Switzerland.
In some situations chemical companies moved or planned to move manufacturing
operations closer to raw material and energy sources.[26]

It must be concluded that, while there appears to be a case for
the internal-economies-of-scale argument and the resulting geographical
horizontal integration, the relationship between ECIs and vertical integration
was not conclusive enough to justify acceptance of the hypothesis. More
and better variables expressing the degree of vertical integration could
possibly yield significantly superior results.

Profitability and Entry Concentration

Thus far the analysis was concerned with rather static corporate
and market conditions and their impact on defensive investment behaviour
of individual firms. Another link should be added by investigating the
relationship between defensive investment behaviour and the performance
of these firms. Specifically this section will examine the possible association
between entry concentration and the profitability of the parent firms'
domestic operations. It can be argued that only consistently profitable
firms can afford to engage in extensive foreign investments, and thus only
highly profitable firms have excess funds available for prompt investments.[27]
The profitability issue may, however, not be as simple as just described.
Alternately a case can be made for quite the opposite. Firms that maintain
highly profitable domestic operations do not necessarily have the inclination
to accept added risks and possibly lower returns by investing abroad. They
may be quite content to continue operating domestically at high profit
margins. It is argued in this study that firms envisaging declining domestic
profit margins at home will attempt to defend the level of their overall

profitability by expanding abroad. It is beyond the scope of this study to investigate all of the factors which could contribute to such a decline in profitability. Some of the more dominant reasons for declines in domestic profitability may be mentioned, as they were specifically emphasized during the personal discussions with European corporation executives. Market saturation and resulting declines in domestic growth rates have already been mentioned above.[28] An other important criterion is the rapidly increasing cost of doing business domestically and of exporting due to significant increases in wage rates, payroll burdens, taxation and unfavourable changes in foreign exchange rates.[29] The information obtained during the course of the personal discussions tends to verify this point, and the statistical analysis of the data appears to point into this direction. Two profitability measures were used for this analysis, pre-tax profit as a percentage of total assets, and pre-tax profit as a percentage of total revenue.[30]

An initial Pearson correlation of raw IECI values with profitabilities did not yield any statistically significant and useful results. The data were then re-ordered into ranks, and these new values were entered into non-parametric correlations which showed significantly improved results. These are given in Table 4-19.

TABLE 4-19

Coefficients of Correlation of IECIs with
Profitability of Domestic Operations

	Return on Assets (n=24)		Return on Sales (n=27)	
	Spearman's r	Kendall's tau	Spearman's r	Kendall's tau
3-year IECI	0.1109(0.303)	0.0979(0.251)	-0.3159(0.054)	-0.2912(0.017)
5-year IECI	0.1504(0.241)	0.1433(0.163)	-0.2926(0.069)	-0.2745(0.022)
7-year IECI	0.1504(0.241)	0.1433(0.163)	-0.2926(0.069)	-0.2745(0.022)
10-year IECI	0.2264(0.144)	0.2122(0.073)	-0.1405(0.242)	-0.1353(0.161)
Average IECI	0.2748(0.097)	0.2447(0.047)	-0.0046(0.491)	-0.0094(0.473)

These results are somewhat conflicting, and they would suggest that firms enjoying higher returns on total assets tend to invest more defensively, while firms experiencing lower returns on total revenues appear to concentrate most highly their entries into foreign countries. However, for the purpose of this study return on sales is a better measure of a firm's performance than return on assets employed, since gross profit margins are better measures indicating the firm's market position. When taking into account only the relationship between return on sales and IECIs, the results appear to verify the declining-profitability contention. Care must, however, be taken in pointing out that the profitability data used for this test represent merely those obtained for 1972. It could be argued that somewhat more dynamic profitability ratios representing longer-term averages should be used. A case could also be made for the use of profitability ratios which existed at or just before the time the individual foreign investments was made. Due to a lack of such data, this study had to be confined to 1972 figures. It seems, however, doubtful whether the direction of the association between return on sales and Entry Concentration would be altered dramatically by using long-term averages or historical data.

Alternatives to Oligopolistic Investment Behaviour

Product Diversification

Product diversification is a characteristic of some of the product pioneering firms and industries. There may be reasons to believe that the degree of its product diversification could affect a firm's foreign investment behaviour.

The argument presented here basically follows along Knickerbocker's lines.[26] While the evidence presented thus far would suggest that European firms made their foreign investment decisions in reaction to their rivals,

some of the large companies that have expanded into foreign markets may not necessarily have been motivated to invest abroad by competitive pressures in a single industry. Many of these firms established themselves by selling a range of products or by operating in various industry groups. Thus diversification at home opened up both the aggressive and the defensive foreign investment alternatives for the parent firms,[32] and it lessens the need for exact matching of every move the firm's competitor makes. This would also suggest a portfolio-type approach to foreign investment decision making. In such an approach for multinational companies, returns would be measured on a world wide basis. By spreading investments over a wide range of products, the effects of the risk in any specific investment upon the firm's results as a whole may be minimized correspondingly.[33] This would mean that these firms were not compelled to follow the alternative route of risk-minimization or minimax which is one of the features of the perpetuation of oligopolistic equilibria.

A major problem was encountered in attempting to test the relation-ship between product diversification and defensive investment behaviour. This was the difficulty in determining what constitutes a product line in individual cases. In some cases rather arbitrary decisions had to be made in defining the number of product lines maintained by some firms. In order to avoid technical or semantic problems, in most cases a product line was simply defined as an area of business.[34] The sample firms' number of product lines maintained domestically and abroad were correlated with Entry Concentration Indices and the results are presented in Table 4-20.

TABLE 4-20

Coefficients of Correlation of IECIs with
Number of Product Lines

	No. of Domestic Product Lines (n=40)		No. of Product Lines Abroad (n=37)	
	Spearman's r	Kendall's tau	Spearman's r	Kendall's tau
3-year IECI	-0.3082(0.026)	-0.2234(0.021)	-0.1329(0.216)	-0.1011(0.189)
5-year IECI	-0.4207(0.003)	-0.3411(0.001)	-0.3809(0.010)	-0.3068(0.004)
7-year IECI	-0.3082(0.026)	-0.2234(0.021)	-0.1329(0.216)	-0.1011(0.189)
10-year IECI	-0.2848(0.037)	-0.2143(0.026)	-0.1543(0.181)	-0.1153(0.158)
Average IECI	-0.3082(0.026)	-0.2234(0.021)	-0.1329(0.216)	-0.1011(0.189)

These results, particularly those of the correlation of IECIs with
the number of domestic product lines appear to verify the product-diversification
argument at least to some extent. Some highly diversified firms, particularly
chemical corporations displayed less concentrated entry behaviour than other
firms operating in much more narrowly defined areas of business.[35]

Caution must however be used in accepting these finding, and tests
using more refined or different data could yield more reliable results. A
great deal of improvement in the definition of product diversity would be
necessary in order to prove or to disprove this argument in a more meaningful
fashion. This was not possible here because of lack of adequate data
covering this area.

It was also apparent during the course of this study that the sample
firms were much more diversified in their domestic markets than in markets of
their foreign affiliates.

This would appear to be consistent with the product cycle theory[36]
which deals with the time lags inherent in the international transfer of
technology. The smaller number of product lines maintained by foreign
affiliates could also be explained by organizational constraints faced by the

firms. New organizational structures and systems would have to be developed for controlling such diversification, before it could actually be undertaken.[37]

Licensing

Without becoming involved in an extensive discussion of licensing as a more or less viable alternative to foreign direct investment, which would be beyond the scope of this study, a brief reference to this subject may be made.

As indicated earlier in this chapter, during the course of the personal discussions, individual European executives were asked to provide the interviewer with value assessments of various factors favouring or inhibiting licensing arrangements with foreign firms not belonging to the corporate group. The data obtained were rather qualitative, and their interpretation is thus largely impressionistic. At the outset, almost three-quarters of the executives questioned favoured direct investment in manufacturing facilities over licensing, and they would not even consider licensing as an alternative except in situations where direct investment was either impossible or unfeasible.

Thus the weights of importance attached to factors generally believed to favour licensing such as:

 i. Lack of Capital to invest abroad
 ii. Lack of personnel to manage foreign investments
 iii. Lack of information concerning local market conditions
 iv. Restrictions of profit remittances, and
 v. Tariff or quota restrictions,

received consistently low ratings with the possible exception being problems concerning repatriation of profits. Of the factors generally believed to inhibit firms from entering into licensing agreements, the highest importance ratings were attached to the following:

i.   Concern for secrecy or uniqueness of the product
ii.   Technology considered a part of the indivisible overall corporate package, and
iii. Lower profitability associated with licensing arrangements.

The results of the correlations of the individual value assessments of factors inhibiting licensing with ECIs have already been presented in Tables 4-9 and 4-10 on p. 38 of this chapter, and the consistently positive and significant correlation coefficients obtained tend to re-inforce the technology issue tested earlier in this chapter. Most of the firms' over-riding concern for protection of their know-how and technology and thus their fear of losing their competitive edge makes licensing a rather unattractive alternative to foreign investment.

Other factors emphasized during the personal discussions were lower profitability and the temporary nature of licensing agreements. The firms felt that where the market is sufficiently large to warrant a viable local operation the individual firm would prefer to reap all of the profits itself rather than receiving the generally lower royalties associated with licensing agreements. Many executives also felt that because licensing arrangements usually cover only a few years, their technology would be beyond their control after the agreements have lapsed. The licensee could then become a significant competitor of the former licensor rivalling him with the use of the same technology and know-how.

Of the factors favouring licensing only the degree of importance attached to lack of management personnel displayed a consistently significant relationship with entry concentration as shown in Table 4-23. This relationship, although rather weak, was consistently negative suggesting that, as the importance of this factor increases, the degree of entry concentration decreases. This appears to re-inforce the superior-management hypothesis described and tested earlier.

TABLE 4-21

Coefficients of Correlation of IECIs with
Lack of Management Favouring Licensing
(n=41)

	Spearman's r	Kendall's tau
3-year IECI	-0.2119(0.092)	-0.1779(0.051)
5-year IECI	-0.2158(0.088)	-0.1871(0.042)
7-year IECI	-0.2158(0.088)	-0.1871(0.042)
10-year IECI	-0.1750(0.124)	-0.1604(0.070)
Average IECI	-0.1845(0.124)	-0.1522(0.080)

Thus oligopolists, usually being large firms with management of a superior calibre, do not feel that lack of available management would prevent the firms from investing abroad and would force them into entering into licensing agreements instead.

The argument presented thus far stating that oligopolists refuse to license, must, however, be qualified. In fact most of the firms license out some of their products and processes even to their competitors, and they receive licenses in return. This inter-company licensing phenomenon particularly exists in the chemical industry, where the firms license each other extensively. There appears to exist a high degree of specialization among the chemical firms in Europe, and newly developed products or processes that do not fit in with an individual firm's area of specialization are usually licensed to a firm that has specialized in this area. Major licensing arrangements usually exist among firms of similar size and power, and they tend to reinforce the market stability which is often associated with oligopoly.[38] Such agreements, however, very rarely cover products of major importance to the firm that developed them.

The last section of this chapter appears to tie in neatly with the overall argument presented thus far.

Summary

The evidence presented in this chapter appears to support the hypothesis which states that foreign direct investment is largely the result of imperfect competition. Tests correlating corporate size measures such as total assets and total employees produced rather inconclusive results, in particular the coefficients of the correlation of total domestic assets with ECIs appeared to even contradict the hypothesis. Better and more consistent supporting evidence was obtained, when variables expressing the firms' ease of access to capital were correlated with the industries' degree of defensive investment behaviour. The results showed positive links between the firms' ease in raising capital -- believed to be a feature of oligopoly -- and defensive investment patterns.

The argument was strengthened further by testing the relationship between the level of technology commanded by the firm and the degree of entry concentration in the industry. Research and Development Expenditures, which were used as variables expressing the degree of technological sophistication, were positively correlated with ECIs meaning that firms which enjoy the advantage over local enterprises of having control over superior technology rival each other in utilizing their know-how in foreign markets.

Control over a calibre of management superior to local firms was also a factor that was positively linked to the degree of entry concentration, which was consistent with the hypothesis tested.

Variables describing oligopolies in product markets, such as the degree of control over the domestic market, were positively associated with ECIs, implying that firms which had achieved stable market shares for

their products at home tended to match their competitors' investments abroad in order to prevent their rivals from becoming too powerful in foreign markets and therefore in overall global competitive terms.

The Economies-of-Scale argument was also verified, as size of individual foreign subsidiaries, expressed by total revenues and assets employed, was positively correlated with the values of the Entry Concentration Indices.

It was further shown that firms facing declining rates of return on sales of their domestic operations tended to concentrate their entries into foreign markets, rivalling each other in attempting to maintain overall profitabilities and market control.

Finally, the evidence suggests that product diversification and licensing were not considered to be feasible alternatives to foreign direct investment for the oligopolist.

Thus after having investigated oligopolistic industry characteristics and their relationship to foreign investment behaviour, the hypothesis seems to have been verified.

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[1] William L. Hays, Statistics pp. 615-620. Holt, Rinehart and Winston, New York, 1963.

[2] ibid. pp. 651-652.and Bent, Hull, Statistical Package for the Social Sciences, McGraw-Hill, New York, 1970 pp. 153-154.

[3] Richard E. Caves: in op. cit. and Kindleberger: in op. cit. pp. 16-18.

[4] See J.W.C. Tomlinson and H.J. Himmelsbach, Foreign Trade and Investment Decisions of European Companies unpublished Working Paper No. 260 Faculty of Commerce and Business Administration, The University of British Columbia, Vancouver, B. C., May 1974.

[5]see Table B-2 in Appendix B.

[6]This became particularly evident in the fall of 1973 during a wild-cat strike by Turkisch workers at the Ford Motor Company in Cologne, which was encouraged and organized by communist and maoist extremists, as reported in the German news media at the time.

[7]For example the Volkswagenwerk A. G. set up manufacturing facilities in Yugoslavia in 1972.

[8]J.W.C. Tomlinson and H. J. Himmelsbach in op. cit.p. 26.

[9]In addition to the destruction of their domestic operations, German firms in particular suffered repeated expropriations in foreign countries where during the two World Wars their subsidiaries including patents and trade marks were seized under Enemy Property Regulations. A famous example is the Bayer Aspirin case.

[10]Kindleberger, in op. cit. pp. 16-18.

[11]A prime example of high R & D expenditures resulting in significant innovation and product improvement is given by the pharmaceutical industry. The European automobile industry also spends considerable amounts on R & D with the result being significant improvements in quality and safety standards as well as the introduction of new products.

[12]This argument appears to coincide with the notion of centralized decision making presented by Kindleberger, in. op. cit. p. 16.

[13]See p.25 above.

[14]Knickerbocker in op. cit. pp. 138-145.

[15]Knickerbocker in op. cit. pp. 145-148.

[16]One major European automobile firm advertised its products for an extended period of time by using the theme: "Not everyone drives our cars".

[17]One firm received its original charter in 1080, making it the oldest still existing firm. Another company was established in 1620 as a state-owned armaments manufacturer, it became privately-owned in 1759 and was finally converted into a publicly limited corporation in 1867.

[18]One automobile company was founded by the man who successfully developed the first efficient motor car. An other firm still bears the name of the man who invented telegraphy and who was later instrumental in the development of telephone exchanges. Most of the European chemical and pharmaceutical corporations were established by scientists who had discovered various chemical compounds and vaccines. One major European steel firm was, until recently, owned by the heirs of the inventor of the process of casting high-quality steel.

[19]A good example for this type of investment pattern is the European chemical industry which, with some exceptions, evolved between 1850 and 1860 and had become an internationally operating industry by the early 1870's.

[20]One electrical equipment producer, founded in 1848 by the inventor of telegraphy, established its first foreign subsidiary in Russia in 1855, because it had been awarded a contract by the Russian government to produce and to install a telegraph system in that country. This affiliate operated profitably until 1918 when it was expropriated by the Bolshevik government.

[21]This is particularly recognized in the case of the European automobile, machinery and electrical equipment producers; quality differentiation is less obvious, but nevertheless existent, in the chemical and pharmaceutical, and steel industries.

[22]Knickerbocker, in op. cit., ch. 4, analyzed the relationship between industry stability and entry concentration; his correlation results, however, do not appear to be very impressive.

[23]Several executives, particularly those of large electrical equipment and chemical producers attached significant emphasis to this point. Already in control over large portions of their domestic markets their firms are able to grow only at rates at which the domestic markets for their products grow. If these firms, as desired, want to achieve higher growth rates, they must expand internationally.

[24]Caves, in op. cit. pp. 266 ff.
Kindleberger, in op. cit. pp. 19-25.

[25]See pp. 26, 29, 47 of this study.

[26]Because of Canada's ample endowment with raw materials and low-cost energy, one major European chemical corporation plans to eventually expand its still rather small Canadian affiliate to such a scale that it could supply the entire European market with plastics which up to now have been manufactured in the parent country which lacks raw materials and where the cost of energy is high. (see Tomlinson and Himmelsbach, op. cit. pp. 24-25).

[27] Knickerbocker, in op. cit. pp. 150-154.

[28] See p. 46 of this study.

[29] An executive of a major European chemical corporation mentioned that although hourly wages in the industry are still lower in his country than those in the United States, total labour costs are higher than those in the U. S. because of higher social costs imposed upon his firm at home.

Recurrent revaluations of the German Mark vis a vis the U. S. dollar and higher productivity of the American worker, due to a lower rate of absenteeism, prompted the Volkswagenwerk A. G. to decide on manufacture of its cars in the United States. (Vancouver Province, May 14, 1974, Frankfurter Allgemeine Zeitung, May 14, 1974.)

[30] Unfortunately the data were such that the portion of the firms' equity capital employed domestically could not be determined, thus in this analysis the more meaningful return on shareholders' equity could not be used.

[31] Knickerbocker in op. cit. ch. 5, presents this argument rather extensively so that the discussion of this subject can be kept fairly brief.

[32] ibid p. 102.

[33] H. Markowitz, Portfolio Selection, Efficient Diversification of Investments, Wiley & Sons, New York, 1959.

[34] See also: Tomlinson and Himmelsbach, in op. cit. pp. 8-9.

[35] This compares with the arguments presented by John M. Stopford and Louis T. Wells, in Managing the Multinational Enterprise; Organization of the Firm and Ownership of the Subsidiaries, Basic Books, New York, 1972.

[36] Raymond Vernon, "International Investment and International Trade in the Product Cycle" reprinted in Dunning, op. cit.

[37] Knickerbocker, in op. cit. p. 116.

[38] Knickerbocker, in op. cit. Chapter 4.

CHAPTER FIVE

GOVERNMENT INTERVENTION AND OLIGOPOLISTIC REACTION

This chapter investigates and tests possible relationships between variables expressing government policies and actions, which are believed to influence the decision processes of foreign investors, and oligopolistic foreign investment behaviour expressed by the degree of Entry Concentration. Thus an attempt is made to prove the validity of the hypothesis which states that actions taken by the home or host country governments have a direct and profound impact upon the individual firm's foreign investment decision.

In order to test possible relationships between government action and entry concentration, Knickerbocker[1] used mainly macro-economic variables related to some twenty-three countries, which he correlated with country ECIs. The results he obtained were not very significant in statistical terms, and the correlation coefficients were rather low. Knickerbocker's regression equations[2] were somewhat more significant and useful.

Rather than introducing macro-economic variables into this analysis, corporate decision variables were used in order to maintain the consistency of this thesis as a management study. In contrast to Knickerbocker's approach, the strength of which was the availability of quantitative data -- possibly at the expense of consistency -- this analysis uses qualitative data chiefly expressing values attached to various decision factors.

Actions Taken by the Home Country Government

Only one qualitative variable was available for the purpose of statistically testing a possible relationship between policies adopted by the firms' home country governments and the degree of entry concentration. These data represented values of importance attached by the respondents to

the impact of their governments' policies upon their firms' decisions to invest in individual countries. The data were correlated with Entry Concentration Indices by countries or areas, and the results are presented in Table 5-1.

TABLE 5-1

Coefficients of Correlation of CECIs[*] with
Importance of Home Government Policies
(n=363)

	Spearman's r	Kendall's tau
3-year CECI	0.0695(0.093)	0.0558(0.056)
5-year CECI	-0.0554(0.146)	-0.0416(0.118)
7-year CECI	-0.1406(0.004)	-0.1149(0.001)
10-year CECI	-0.0731(0.082)	-0.0598(0.045)
Average CECI	-0.0876(0.048)	0.0682(0.026)

[*]'CECI' stands for Entry Concentration Index by Country.

The above results appear to refute the hypothesis as they suggest that high concentrations of entries into certain geographical regions tend to be associated with low importance ratings attached to the firms' home country governments' policies designed to stimulate foreign investments. These results may be due to the choice of ECIs by country as dependent variables, and the extent to which all industries rushed into individual countries may not be dependent upon measures adopted by their parent country governments.

To check the evidence further, the data expressing the impact of home government actions upon individual investment decisions were correlated with ECIs by industry. The results of this test are shown in Table 5-2.

TABLE 5-2

Coefficients of Correlation of IECIs* with
Importance of Home Government Policies
(n=363)

	Spearman's r	Kendall's tau
3-year IECI	0.0265(0.332)	0.0231(0.285)
5-year IECI	-0.0033(0.478)	-0.0021(0.480)
7-year IECI	-0.0227(0.333)	-0.0227(0.259)
10-year IECI	0.0524(0.160)	0.0462(0.094)
Average IECI	-0.0227(0.333)	-0.0227(0.259)

*IECI stands for Industry Entry Concentration Index.

These results were also rather inconclusive and statistically not significant. One can draw the conclusion that no relationship exists between ECIs by industry and the impact of home country government policies upon the firms' decision to invest.

These results can, however, be explained. Of the seven countries whose firms were surveyed, only three governments had adopted some policies making foreign investment attractive to their industries. Some of these measures will be outlined below. Apart from some Foreign Aid legislations, most other measures were introduced by those governments only recently, and they did not influence most of the investments covered by this study which were made during the 1950's and 1960's.

At any rate, had these policies been in effect earlier, they would not have been of prime importance to decisions to invest abroad. Executives of firms domiciled in countries whose governments discourage domestic expansion or encourage foreign investment stated that such policies, although taken into account in general corporate strategies, did not necessarily affect decisions to invest in particular countries. The fact that examples of such

government policies were frequently cited by the respondents, implies, however, that they were at least considered in some of the more recent investment decisions, and their importance will probably be more pronounced in the future.

Incentives

The German government appears to offer the most comprehensive package of incentives to firms investing abroad, particularly in developing countries. These are mainly in the area of taxation. Under the German Property Tax Act[3] foreign property taxes paid can be offset against property tax liabilities in Germany (elimination of double taxation), and higher exemptions apply to investments in developing countries.

Under the Foreign Investments Act[4] tax-free reserves can be established, losses of foreign subsidiaries can be offset against the profits of German operations, and allowances for losses of foreign affiliates can be deducted from pre-tax income in Germany.

In addition to these regulations, special write-offs, depreciation schedules, tax-free allowances for losses and reserves apply to investments in specified developing countries according to the Foreign Aid Tax Acts.[5]

The French government appears to offer some modest incentives to French firms that invest in former French colonies, and it neither encourages nor discourages investments in other developing countries.[6]

Such direct home country government incentives to invest abroad, although considered by individual companies, do not appear to have the desired effect of substantially increasing direct investment in the specified developing countries.[7]

Some more indirect incentives for foreign investment are provided by virtually all of the respondents' home governments in the form of foreign investment insurance schemes[8] or treaties signed with the prospective host countries. Many of the respondent firms stated that foreign investment insurance was an important hedge against the risk of expropriation and they had their foreign affiliates insured against such a contingency.

Several firms, particularly Belgian and Swiss corporations, would not consider investments in countries with which their governments do not have compensation treaties. In fact some of the Belgian, Swedish and Swiss sample firms received some compensation from the governments of Czechoslovakia, Poland and Rumania for their nationalized affiliates in those countries and for defaulted government bonds issued by pre-war administrations.[9]

Discouragement of Domestic Expansion

Another indirect means for governments to encourage investment abroad is restricting domestic expansion. Such policies have been adopted by the governments of Germany, The Netherlands and Switzerland only recently, and the effects of these measures were not yet reflected in the evidence presented above. The respondents felt, however, that their future foreign investment decisions will be significantly affected by these policies.[10]

The German and Dutch governments in particular passed stringent anti-pollution regulations which tend to significantly restrict domestic expansion of such pollution-intensive operations as those of chemical producers and steel mills. Executives of those companies emphasized, however, that it was not their firms' policy or desire to export pollution to other countries. They felt that in some cases it could be more economically feasible to establish modern and less environmentally damaging plants abroad than spending large funds on some older domestic plants with the purpose of reducing their harmful emissions.

Increased Government Regulation
of Business Affairs

Some executives of German, Dutch and Swedish firms, some of
which were privately-owned, expressed their concerns over their governments'
ever-increasing involvement in and interference with the operation of the
free market economy and the individual firm's freedom to conduct business.
In particular, the recently elected socialist administrations of Germany
and The Netherlands were strongly criticized for placing too heavy a burden
upon industry. A highly controversial bill presently being considered
by the German Bundestag would grant representatives of labour unions fifty
percent of the seats on the boards of directors. Although this regulation
is designed to apply only to large corporations, owners of smaller and
medium-sized firms fear that this legislation could be extended to apply
to their firms in the future.[11]

Finally, government legislation increasing the cost of conducting
business was also cited by some respondents as a factor influencing their
decisions to invest abroad. Social welfare and security legislation,
increased payroll burdens, and as a possible result, a deterioration of
the work ethic, particularly in Germany, The Netherlands and Sweden, were
also mentioned as being factors increasing the firms' difficulties in
conducting their business and in competing with firms domiciled in countries
whose industries do not have to contend with these burdens.[12]

Thus actions taken by the parent country governments, although
having lacked impact in the past, will have more influence upon their firms'
foreign investment decisions in the future.

Actions Taken by the Prospective
Host Country Authorities

As described in Chapter Three of this thesis, the oligopolistic
investment theory states that policies of the prospective host country
governments have a profound impact upon the investment decisions of individual
companies. In this section, the attempt is made to verify this hypothesis.
As in the previous section of this chapter the data used expressing government
attitudes and policies were in qualitative rather than quantitative form.

Host Government Incentives

As a starting point for the analysis, a rather general variable
expressing the respondents' assessment of the importance of host government
incentives upon individual investment decisions was correlated with ECIs
by countries. The results of this test are presented in Table 5-3.

TABLE 5-3

Coefficients of Correlation of CECIs with
Importance of Host Government Incentives
(n=363)

	Spearman's r	Kendall's tau
3-year CECI	0.2228(0.001)	0.1732(0.001)
5-year CECI	-0.0920(0.040)	-0.0603(0.043)
7-year CECI	-0.2862(0.001)	-0.2180(0.001)
10-year CECI	-0.2284(0.001)	-0.1777(0.001)
Average CECI	-0.1979(0.001)	-0.1386(0.001)

These results were statistically significant and they displayed some consistency in the direction of the weak linear association between the impact of host government incentives upon individual investment situations. This evidence would suggest that firms which attached higher degrees of importance to host government incentives did not generally follow others in entering into these countries or areas where such incentives were offered, or alternately firms tended to rush into countries which either did not offer special investment incentives or whose incentives did not affect the investment decision.

In order to check these results further the same data expressing the importance of host government incentives were correlated with ECIs by industry, and the results of this analysis are shown in Table 5-4.

TABLE 5-4

Coefficients of Correlation of IECIs with
Importance of Host Government Incentives
(n=363)

	Spearman's r	Kendall's tau
3-year IECI	0.0447(0.198)	0.0341(0.166)
5-year IECI	0.1245(0.009)	0.0962(0.003)
7-year IECI	0.0593(0.130)	0.0501(0.077)
10-year IECI	0.1277(0.007)	0.1058(0.001)
Average IECI	0.0593(0.130)	0.0501(0.077)

The evidence revealed by this latter test implies that there is no clear-cut association between the degree of importance of host government incentives and the extent to which firms in the same industry group rival each other in entering countries offering incentives that would be important to those firms.

TABLE 5-5

Coefficients of Correlation of CECIs with
Importance of Individual Guarantees Received
(n=268)

Guaranteed Repatriation of		3-year CECI	5-year CECI	7-year CECI	10-year CECI	Average CECI
Dividends:	Spearman's r:	0.1572(0.005)	-0.1751(0.002)	-0.2109(0.001)	-0.2239(0.001)	-0.2134(0.001)
	Kendall's tau:	0.1191(0.002)	-0.1603(0.001)	-0.1577(0.001)	-0.1639(0.001)	-0.1742(0.001)
Capital:	Spearman's r:	0.1588(0.004)	-0.1769(0.002)	-0.2130(0.001)	-0.2264(0.001)	-0.2154(0.001)
	Kendall's tau:	0.1202(0.002)	-0.1615(0.001)	-0.1594(0.001)	-0.1662(0.001)	-0.1754(0.001)
Royalties:	Spearman's r:	0.1001(0.051)	-0.1708(0.003)	-0.1483(0.008)	-0.1471(0.008)	-0.1819(0.001)
	Kendall's tau:	0.0761(0.032)	-0.1549(0.001)	-0.1143(0.003)	-0.1057(0.005)	-0.1518(0.001)
Interest:	Spearman's r:	0.1545(0.005)	-0.1978(0.001)	-0.2186(0.001)	-0.2172(0.001)	-0.2169(0.001)
	Kendall's tau:	0.1174(0.002)	-0.1768(0.001)	-0.1614(0.001)	-0.1542(0.001)	-0.1761(0.001)
Loan Principal:	Spearman's r:	0.1356(0.013)	-0.2148(0.001)	-0.2141(0.001)	-0.2122(0.001)	-0.2235(0.001)
	Kendall's tau:	0.1015(0.006)	-0.1916(0.001)	-0.1559(0.001)	-0.1480(0.001)	-0.1795(0.001)

TABLE 5-6

Coefficients of Correlation of CECIs with
Importance of Special Grants Received
(n=265)

Guaranteed Special:		3-year CECI	5-year CECI	7-year CECI	10-year CECI	Average CECI
Tax Rates:	Spearman's r: Kendall's tau:	-0.2021(0.001) -0.1711(0.001)	-0.1154(0.030) -0.0958(0.010)	0.1812(0.001) 0.1544(0.001)	0.1899(0.001) 0.1604(0.001)	0.0798(0.096) 0.0670(0.051)
Depreciation Rates:	Spearman's r: Kendall's tau:	-0.1820(0.001) -0.1546(0.001)	-0.1327(0.015) -0.1093(0.004)	0.1594(0.005) 0.1353(0.001)	00.1725(0.002) 0.1449(0.001)	0.0706(0.126) 0.0579(0.080)
Investment Grants, Low-Cost Loans:	Spearman's r: Kendall's tau:	-0.1306(0.017) -0.1064(0.005)	-0.1833(0.001) -0.1550(0.001)	0.0642(0.149) 0.0503(0.111)	0.0655(0.144) 0.0551(0.091)	-0.0208(0.368) -0.0240(0.280)
Tax Holidays:	Spearman's r: Kendall's tau:	-0.1597(0.005) -0.1338(0.001)	-0.1265(0.020) -0.1069(0.005)	0.1401(0.011) 0.1189(0.002)	0.1541(0.006) 0.1302(0.001)	0.0616(0.159) 0.0501(0.112)
Low Import Duties:	Spearman's r: Kendall's tau:	-0.1048(0.043) -0.0841(0.020)	-0.1812(0.001) -0.1544(0.001)	-0.0033(0.479) -0.0032(0.469)	0.0526(0.196) 0.0466(0.128)	-0.0373(0.272) -0.0356(0.193)
Tariff Protection:	Spearman's r: Kendall's tau:	-0.1142(0.031) -0.0957(0.010)	-0.1320(0.015) -0.1107(0.003)	-0.0628(0.153) 0.0539(0.094)	0.1198(0.025) 0.1010(0.007)	0.0352(0.283) 0.0262(0.261)
Other:	Spearman's r: Kendall's tau:	-0.2147(0.001) -0.1844(0.001)	-0.0864(0.079) -0.0737(0.036)	0.1727(0.002) 0.1481(0.001)	0.2245(0.001) 0.1935(0.001)	0.1174(0.027) 0.1000(0.007)

After having tested possible associations between these rather general data and ECIs, data expressing the importance of a series of individual incentives received and their importance to the firms' investment decisions were correlated with ECIs by country. The results of these tests are presented in Tables 5-5 and 5-6.

The evidence presented in the above mentioned tables tends to confirm the results obtained earlier. The correlation coefficients had almost consistently negative and statistically significant values. A further test involving correlations of these incentivesvariables with ECIs by industry failed to produce statistically significant relationships; this then would neither confirm nor refute the evidence assembled thus far. Thus oligopolists generally do not seem to 'crowd' their investments in countries which offer various assurances and guarantees. These findings may, to some extent, be due to the fact that the majority of the firms' subsidiaries were located in industralized countries which do not usually offer special incentives to individual firms, or whose governments were not asked by the firms for special assurances or grants.

Generally, however, if at all important, such assurances, guarantees and incentives were only of secondary value to the respondent firms which welcomed them as bonuses. Firms did not, as a rule take into account such incentives when calculating the feasibility of individual investment opportunities.

Several executives commented on this issue expressing their doubts of the success of investment incentive programs when considered from the point of view of the host goverments. "Such incentives are welcome and we would be foolish not to accept them, but the foreign venture must be feasible on its own merits and it would constitute bad corporate policy, if such incentives would be included in projected profitabilitjes rather than treated as incidental bonuses. All the promises, guarantees and grants can disappear

overnight with a change in government. When investing in foreign countries one must make a long-term decision and disregard rather temporary incentives. If this rule had been disregarded by firms that had invested in South America, many of those subsidiaries would probably have encountered tremendous difficulties because of disappearing incentives." (An executive of a firm with extensive interests in South America.)

Thus the notion that host government incentives and assurances entice oligopolists to invest in their countries cannot be accepted on the basis of the evidence obtained in this study. Further research in this area could possibly arrive at different conclusions from those presented here, and it is clearly necessary to test the validity of such an argument.

Import Restrictions

A case can be made for host government restrictive trade policies as being an important factor in forcing oligopolists to undertake defensive investments in order to maintain a threatened market. In this section the attempt is made to verify this hypothesis.

Initial tests involving the use of ECIs by country or area failed to produce any statistically significant results; further use of CECIs had to be abandoned, and instead ECIs by industry were used as dependent variables.

At the outset a qualitative explanatory variable expressing the importance of protecting a threatened market, when individual investment decisions were made, was correlated with ECIs by industry. The results of this test are shown in Table 5-7.

TABLE 5-7

Coefficients of Correlation of IECIs with
Importance of Market Protection
(n=363)

	Spearman's r	Kendall's tau
3-year IECI	0.0961(0.039)	0.0849(0.010)
5-year IECI	0.0961(0.039)	0.0837(0.011)
7-year IECI	0.2847(0.001)	0.2297(0.001)
10-year IECI	0.2524(0.001)	0.2032(0.001)
Average IECI	0.2847(0.001)	0.2297(0.001)

This relationship was consistently significant in statistical terms yielding positive correlation coefficients of somewhat low values. Thus there appears to be a positive linear association between the importance of defending a threatened market and the degree of entry concentration.

The matter of defensive investment behaviour was pursued further, and firms were asked to provide their assessments of the importance of tariffs and other trade barriers upon individual foreign investment decisions. The data obtained were then correlated with IECIs. The correlation coefficients resulting from this test are presented in Table 5-8.

TABLE 5-8

Coefficients of Correlation of IECIs with
Importance of Tariffs and Quotas
(n=363)

	Spearman's r	Kendall's tau
3-year IECI	0.2703(0.001)	0.2219(0.001)
5-year IECI	0.0615(0.121)	0.0488(0.082)
7-year IECI	0.3627(0.001)	0.3055(0.001)
10-year IECI	0.3316(0.001)	0.2768(0.001)
Average IECI	0.3627(0.001)	0.3055(0.001)

These results showed consistently positive correlation coefficients, some had fairly good values, and most of these were statistically significant. This implies that, as a general rule, trade restrictions imposed by the prospective host countries tend to force firms to react defensively by rushing into those countries and establishing local manufacturing units.

The tariff issue was tested further, as information was also received on levels of tariffs that existed in some countries, before the respondent firms invested there. These data were correlated with IECIs, and the results of this analysis are presented in Table 5-9.

This evidence suggests that a fairly good case can be made in favour of the tariff and quota argument. Thus high tariff barriers that restrict growth of the firms' sales in that market, or that even threaten the firms' market position, force firms to invest in manufacturing operations in the countries in question.

Firms producing automobiles, electrical equipment and machinery were particularly affected by tariff rates and other trade barriers which virtually forced them to make decisions to invest in local production, particularly in South America, India, and to some extent Japan, Canada and the United States. The European automobile industry's export markets were particularly threatened by the introduction of local-content rules in various countries.[13] "When the South African government introduced local content requirements, we had the choice of either abandoning that market or assembling our automobiles locally. We chose the latter course; later we had to change our assembly operation into a full manufacturing unit, because the government had raised the local-content rules to a level which made assembly of knocked-down units virtually impossible."[14]

TABLE 5-9

Coefficients of Correlation of IECIs with
Individual Tariff Rates
(n=

Tariff Rate of Country		3-year IECI	5-year IECI	7-year IECI	10-year IECI	Average IECI
A (n=43):	Spearman's r:	0.2182(0.080)	0.2388(0.062)	0.2388(0.062)	0.2551(0.049)	0.1024(0.257)
	Kendall's tau:	0.1938(0.033)	0.2162(0.021)	0.2162(0.021)	0.2403(0.012)	0.1078(0.171)
B (n=37):	Spearman's r:	0.3736(0.011)	0.3302(0.023)	0.3302(0.023)	0.1115(0.256)	0.2818(0.046)
	Kendall's tau:	0.3297(0.002)	0.3002(0.004)	0.3002(0.004)	0.1078(0.174)	0.2573(0.013)
C (n=30):	Spearman's r:	0.4521(0.006)	0.4541(0.006)	0.4541(0.006)	0.3596(0.025)	0.3760(0.020)
	Kendall's tau:	0.4028(0.001)	0.4158(0.001)	0.4158(0.001)	0.3434(0.004)	0.3405(0.004)
D (n=24):	Spearman's r:	0.2236(0.147)	0.2270(0.143)	0.2270(0.143)	0.1784(0.202)	0.1966(0.179)
	Kendall's tau:	0.1981(0.087)	0.2089(0.076)	0.2089(0.076)	0.1698(0.123)	0.1760(0.114)
E (n=22):	Spearman's r:	0.3174(0.075)	0.2846(0.100)	0.2846(0.100)	0.0998(0.329)	0.2590(0.122)
	Kendall's tau:	0.2859(0.031)	0.2667(0.041)	0.2667(0.041)	0.0982(0.261)	0.2421(0.057)

Complete or partial prohibition of imports by several countries during the early 1950's forced automobile and pharmaceutical firms in particular to invest in local operations. According to the executive of a major European automobile company "The Argentine government prohibited all further imports of motor vehicles during the early 1950's, and in Brazil tariffs were raised to prohibitive levels. Our company did not want to lose these large and lucrative markets to our U. S. competitors, and we made the decision to manufacture at least our trucks in these countries while abandoning our less important Argentine passenger car market; we are still exporting passenger cars to Brazil despite the high tariffs. This is due to the fact that our cars compete on the basis of quality and as status symbols, and they are thus products that are sold under price-inelastic demand conditions."

The pharmaceutical industry is virtually unable to export its products in significant amounts to foreign countries because of local government regulations differing from those in the home country with respect to composition, quality and usage. "We had to invest in the countries we are operating in today, including Canada, because pharmaceuticals have to be certified by the local authorities; it is quite difficult for a foreign drug to obtain this certification. Thus incorporating locally and manufacturing the products there is the only viable method for maintaining or expanding our market position in that country and preventing our competitors from squeezing us out of that market entirely."[15]

In contrast to the evident lack of impact that direct government incentives had upon the firms' investment decisions, the evidence presented in this final section suggests that the import-restriction argument can be supported more effectively. Thus government action designed to force firms to substitute local manufacture for exports and to threaten them with loss of that market to competitors, unless the firms comply, appears to be an

effective measure only if the particular market or its potential was sufficiently large and important to the individual firm that it could not afford to abandon it and yield it to competitors.

This evidence contrasts with the findings of Scaperlanda and Maurer[16] who presented the proposition in their study of U. S. direct investment in the European Economic Community. that U. S. firms invested in the EEC chiefly, because it constituted a large market which could not be ignored and where U.S. firms felt their presence was mandatory. The tariff argument could not be sufficiently substantiated in their study, which was based largely on relationships between macroeconomic variables.

However, the large-market argument is by no means rejected in the present study; most firms stressed the importance of being present in certain markets. They did, however, undertake mainly defensive investments in order to avoid losing individual markets due to restrictive trade policies or in order to enable them to expand their market positions which they could not achieve through exporting.

Summary

The above analysis showed that actions taken by the firms' home country governments have not produced the desired effects, in particular investments in developing countries have not resulted from parent government incentives to any significant extent.

Measures adopted by some home countries designed to curb further domestic expansion have only recently affected their industries' investment decisions. It is expected that these policies will be more pronounced in their impact upon foreign investment decisions in the future.

Similarly it was shown that host government incentives did not appear to materially affect the sample's foreign investment decisions. Such incentives were merely regarded as incidental but welcome bonuses.

However, the evidence presented above suggests that high tariff rates and the erection of prohibitive non-tariff barriers seem to be fairly effective in forcing oligopolists to manufacture locally in order to avoid losing their market positions to competitors that choose to manufacture locally.

The evidence presented in this chapter implies that government regulations involving penalties and/or threats appear to be more effective in 'enticing' oligopolists to invest abroad than incentives. In other words the stick is more powerful than the carrot.

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[1]Knickerbocker, in _op. cit._ pp. 171-191.

[2]_ibid._ p. 182

[3]Bundesrepublik Deutschland, _Vermoegenssteuergesetz_, Sec. 9, 9a BGBL. IS. 1856, Bonn (Germany), 1970.

[4]Bundesrepublik Deutschland, _Auslandsinvestitionengesetz_, BGBL. IS. 1214, Bonn (Germany), 1969.

[5]Bundesrepublik Deutschland, _Entwicklungshilfe-Steuergesetz_, BGBL. IS. 217, Bonn (Germany), 1968

Bundesrepublik Deutschland, _Verordnung ueber Entwicklungslaender i.S. des Entwicklungshilfe-Steuergesetzes_, BGBL. IS. 1173, Bonn (Germany), 1967.

[6]"While our government encourages investment in French Africa, for example, its attitude is one of neutrality toward investment in other developing nations. Our government does, however, take a dim view, if a French firm invests in production facilities in Belgium or Germany." (an executive of a major French automobile company).

[7]The lack of success of such incentives provided by the German government was pointed out by Deutsche Gesellschaft fuer wirtschaftliche Zusammenarbeit, in Jahresbericht 1972, Bundersministerium fuer wirtschaftliche Zusammenarbeit, Bonn (Germany), 1973.

[8]A more detailed description of some of the export credit and foreign investment insurance schemes of selected European countries was presented by: J. G. Brown in The Export Development Corporation, its Role and Effectiveness in B. C. unpublished M.B.A. Thesis, University of B. C., 1971.

[9]An executive of a major Swiss electrical equipment manufacturer made these comments: "Although we only received relatively small compensation from the Polish and Rumanian governments, our investment in the affiliates there had been repatriated before the change in government; the payback periods were quite short, and we had even repatriated some profits. Thus losing our Polish and Rumanian affiliates was not a very painful matter".

[10]The Swiss government recently severly curtailed immigration into Switzerland; this policy further aggravated the already existing shortage of labour and will ultimately force some of the Swiss firms surveyed to make investments in new plants abroad rather than at home.

A Dutch executive made the following comments: "Our government would like to see Dutch firms invest anywhere in the world but in The Netherlands because of social, political and environmental problems associated with further expansion of industry".

One German chemical firm employed fifty thousand people at its main plant, and the radius of its workers commuting daily to and from work covered approximately fifty to sixty miles. "There is no way we can materially add to our plant capacity here, because our labour-intake radius would then have to increase to eighty or one hundred miles, and no-one would be willing or able to commute over such distances. We are also unable to import and to accommodate additional foreign workers near our plant because of recently imposed restrictions of immigration of foreign labour, and because of severe housing shortages in this area brought about by measures designed to halt growth of urban areas. To set up new plants in other regions of Germany would not solve this problem either, thus we are virtually forced to make new investments abroad and to limit our capital expenditures in Germany to improvements of existing facilities" (an executive of one of the largest German chemical corporations).

[11]A personal friend of this writer sold his highly profitable firm in The Netherlands -- where the situation is similar to that in Germany -- precisely for this reason in the fall of 1973. He subsequently invested the monies he realized from the sale in Switzerland and Belgium whose governments are still committed to maintaining free market systems operating without excessive government regulation.

[12]The German automobile and chemical industries in particular
are now at a disadvantage vis a vis their U. S. competitors because of
higher labour costs in Germany and lower relative productivity of the
German worker.

[13]Some of the countries named by the respondents were: Canada,
Brazil, Argentina and most other South American nations, South Africa,
Australia and some Asian countries.

[14]This comment was made by an executive of a major European
automobile company.

[15]An executive of a major European producer of pharmaceuticals
made these comments about his firm's experiences with respect to local
government policies; this firm has had manufacturing operations in Canada
since 1947.

CHAPTER SIX

CONCLUSION

In this study the attempt was made to assess the validity of the oligopolistic competition theory of foreign direct investment with the use of European examples. The evidence presented implies that the hypothesis formed at the outset of this thesis has essentially been verified.

Summary of the Findings

At least some weak links were established between oligopoly in factor markets and defensive investment behaviour.

It was found in particular that high levels of technology controlled by individual firms were positively and significantly related to degrees of Entry Concentration. This test also revealed that oligopolists concentrate their Research and Development efforts in their home countries, and they spend relatively small sums on R & D abroad. Thus firms tend to invest defensively in order to protect their know-how and technology.

The mainly conceptual evidence presented also tended to verify that companies concentrating their entries into foreign countries are usually endowed with a superior calibre of management vis a vis local enterprises.

Links between degrees of oligopolistic competition in output markets were also presented in this study.

Some positive relationships were established between degrees of product differentiation and entry rivalry. It was also demonstrated that firms having achieved strong market positions at home tend to rival each other in investing in foreign countries in order to obtain similar market positions abroad. Thus oligopolistic equilibria in the domestic markets tend to spill over into the international scene.

A weak link was also established between economies of scale and entry rivalry. This suggests that defensive investments are chiefly sizeable commitments on the part of the parent firms. Some evidence of firms rushing to integrate vertically was also found to exist chiefly among metal producers and, to some extent, chemical corporations.

It was also found that firms whose profit margins were low or declining tended to invest abroad in a more concentrated manner than companies enjoying high levels of profitability. Highly profitable firms are not necessarily inclined to accept added risks and possibly lower returns by investing abroad. Firms whose domestic profitability is low or declining will, however, attempt to defend their overall profitability by investing in foreign countries.

Product diversification and licensing, believed to be alternatives to foreign direct investment, were analysed, and their relationships to oligopolistic investment behaviour were assessed. These courses of action, however, were not found to be viable alternatives for oligopolists. In particular licensing was rejected, because such an arrangement does not offer the firm sufficient protection and control over its technology. Also royalties are insufficient compensation for the know-how made available by the licensor.

Finally the evidence presented in this thesis only partially supports the notion that government policies have considerable impact upon the foreign investment decision process of oligopolies.

Neither home nor host country government incentives appeared to spur investments to any significant degree. It was shown that foreign aid policies of some capital exporting countries, notably Germany, did not materially affect their firms' decisions to invest in developing countries. Investment incentives offered by capital importing countries, although considered to have been welcome bonuses, did not appear to have had significant impact upon individual investment decisions.

'Negative incentives' provided by governments, however, appeared to have been more effective in spurring foreign direct investment. For example, the evidence suggests that policies adopted by some of the parent country governments designed to discourage domestic industrial expansion appear to have forced some firms to invest abroad extensively.

Measures adopted by capital importing countries designed to inhibit imports and thus threatening the foreign firms' markets appeared to have been more effective in attracting foreign investment than generous investment incentives. In particular tariffs, quotas and other import restrictions and local-content rules seemed to have forced firms to substitute local manufacture for exports.

Implications for Capital Importing Countries, Canada in particular

The country that must import capital in order to develop its industrial structure is faced with the situation where a few large foreign firms control the technology and skills that are needed for this purpose, and it may fear to be at a disadvantage with its bargaining power vis a vis these oligopolists.

However, if its market is sufficiently large, and if the foreign firm had already exported its products to that country, its government enjoys considerable leverage over the foreign firm's investment decision.

It is not suggested here that Canada should raise her tariff walls or tighten import quotas, this would not only contravene the GATT convention to which Canada is a signatory, it would also result in retaliation on the part of her major trading partners which she could not afford.

There may, however, be room for other policies through which investment can be attracted. As a general rule, this should not so much be done by way of generous incentives but through such measures as for example local-content rules and moral suasion. Canada's record of political stability is a further advantage that she can offer to investors.

Since oligopolists tend to rival each other in entering into a foreign market, Canada would have considerable bargaining power by attracting one member of the industry, as the other members may want "in" as well. A high entrance fee could be demanded from the others, possibly in the area of ownership, and the Foreign Investment Review Act appears to be an effective means by which such a fee can be extracted. Because, as mentioned earlier, Canada may want to attract less U. S. investment in the future, European investment may be a counterbalancing force. It may also be easier to persuade European parent firms to make some equity in the venture available to Canadians, since European companies appear to be less rigid in their ownership and control policies than U. S. firms.

In order to prevent permanent dependence upon technology discovered and perfected in the foreign investors' home countries, special rewards should be offered and given to the firms, if they conduct and expand Research and Development in Canada. This could be an important factor in Canada's drive toward development of more secondary industries.[1]

Such measures presuppose, however, the existence of a well-defined development strategy for Canada, and industries selected for that purpose must fit that pattern.

From Domestic to Multinational Oligopolies

The evidence presented in this study suggests that oligopoly, once entrenched in domestic markets of the advancing countries, tends to expand internationally because of inter-company rivalry. Some of Canada's industrial

sectors, in particular the aluminum, agricultural machinery, mining and petroleum industries, have already entered that stage. It may be worth considering whether Canada wants to develop into a major base for international companies in the future.

Hymer and Rowthorn went to the extreme in predicting that firms will take part in a process of cross-investment in the important national and international markets, and this will ultimately lead to multinational market structures, each of which will be dominated by a few multinational firms and characterized by stable oligopolistic equilibria.[2]

Such an extreme development in international business affairs would, however, depend to a large extent upon government policies or a lack thereof, and such a prediction tends to be pure conjecture or speculation in that it assumes away the countervailing power of governments.

This study merely looked at one area of international investment theory. Further and more thorough analysis of this subject will be necessary; in particular further refinement of the data and additional treatment of the variables used for testing the theory may be necessary. It is suggested, however, that the use of more sophisticated and complex analytical methods, is likely to reinforce the general conclusions of this study by clarifying details and directions of causation.

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[1] P.W. Fischer, in Der Einfluss des Auslandskapitals auf die Wirtschaftliche Entwicklung Argentiniens 1880-1964. Ibero-Amerika-Institut fuer Wirtschaftsforschung Universitaet, Goettingen, Germany, 1970 reached a similar conclusion in the case of Argentina.

[2] Hymer, Stephen and Rowthorn, Robert in "Multinational Corporations and International Oligopoly: The Non-American Challenge", in Kindleberger (ed.) The International Corporation pp. 81-82. M.I.T. Press, Cambridge, Mass., 1970.

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A P P E N D I X

APPENDIX A

SELECTION OF THE SAMPLE AND RESEARCH METHOD

Preliminary Research

For the purpose of obtaining a list of European firms that maintain subsidiaries outside their home countries, several sources of information were used. As a starting point, the various European Trade Missions or Consular Offices in Vancouver, B. C., were contacted to provide some information either in the form of additional contacts[1] or reference materials.[2]

Two Trade Commissioners through their home offices established contacts with firms and cleared the way for interview appointments. Three Trade Commissioners produced lists of internationally operating firms domiciled in their countries, thus making additional search for a sample of firms unnecessary.

Number of Firms Selected and Breakdown by Countries

A total of one hundred firms were approached located in the following countries:

Austria	14
Belgium	11
France	11
Germany	24
Netherlands	5
Sweden	19
Switzerland	16
Total	100

Fifty-two firms participated, and of those, three answered questionnaires while executives of the remaining forty-nine firms were personally interviewed.[3]

The net sample of the firms was broken down into the following countries:[4]

Austria	5
Belgium	4
France	5
Germany	14
Netherlands	2
Sweden	10
Switzerland	12
Total	52

Research Method

An extensive questionnaire was prepared in English and German, but it was not mailed to the interviewees in advance. Based on previous experience in similar studies, a poor participation rate and an inferior quality of responses would have been expected. Executives generally displayed unfavourable attitudes toward questionnaires that have been flooding their offices. Some executives stated, that, while they were generally favourable toward personal discussions about their firms, they refused to even consider answering questionnaires mailed to them.[5] Questionnaires, either in English or German, were, however, mailed to thirty-two firms in France (4), Germany (15) and Switzerland (13), which could not be visited because of time constraints. As expected, the results were rather meagre; of the six firms that replied acknowledging receipt of the questionnaires, only two companies answered the questions, while the remainder refused to participate.

Thus, instead of mailing questionnaires to the participating firms, their top executives were personnally interviewed, while the questionnaire was merely used as a guide and framework within which the interviews were conducted. These interviews were between ninety minutes and four hours in duration.

APPENDIX B

Calculation of Entry Concentration Indices

In order to be able to compute Entry Concentration Indices, it was necessary to obtain the following information from the respondent firms:

1. The firm's nature of business,

2. the countries where the firm's subsidiaries are located, and

3. the years in which each individual foreign affiliate was established. While the first two sets of data were relatively easily obtained, exact information on the dates, when the firms' individual subsidiaries were established, was not always readily available.

As mentioned in Chapter One, the analysis was restricted to foreign investments made during the period following World War II.

ECI by Industry

Entry Concentration Indices (ECIs) were computed for five industry groups:

1. Primary Metals and Metal Fabrication
2. Machinery
3. Automobiles and Transportation Equipment
4. Electrical Equipment and Electronics, and
5. Chemicals and Pharmaceuticals.

Because of small sample sizes, individual countries had to be grouped into the following six broad geographical regions for the purpose of this computation:

1. Canada and U.S.A.
2. Latin America
3. Europe
4. Africa
5. Southwestern Asia, and
6. Australasia and Japan.

A minimum of two entries per country was necessary for the computation of an ECI by industry.

Using the subsample Chemicals and Pharmaceuticals as an example, the computation of an ECI is demonstrated. The largest numbers of entries into the individual geographical regions are determined for any 3-year, 5-year, 7-year and 10-year period. These figures are then totalled up and divided by the total number of entries. The figures obtained represent the percentages of total interactions that occurred during any given 3-year, 5-year, 7-year or 10-year interval.

Finally, a simple average of these four figures is computed representing the Average Entry Concentration Index for the period. Table B-1 presents the calculation method and results obtained for the industry group Chemicals and Pharmaceuticals.

ECI by Country or Area

The procedure used for computing ECIs by country or area is essentially the same as the method used for determining ECIs by industry. Nineteen countries or geographical regions were established, and individual entries of all industries into these regions were used for the computation.

The data obtained are shown in Table B-3.

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[1] For example: Bundesverband der Deutschen Industrie.

[2] Such reference materials used were published by German and Swiss banks and by the General Export Association of Sweden.

[3] The research method will be described below.

[4] For a more detailed description of the respondent firms and their foreign affiliates see Tomlinson and Himmelsbach, Foreign Trade and Investment Decisions of European Firms.

[5] Tomlinson and Himmelsbach, in Foreign Trade and Investment Decisions of Canadian Firms, found similar reactions among Canadian executives.

Example of Construction of Entry Concentration Indices
(Chemical and Pharmaceutical Industry)

Entry Into Area	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Maximum No. of Subs. Formed in any 3-year Period	Maximum No. of Subs. Formed in any 5-year Period	Maximum No. of Subs. Formed in any 7-year Period	Maximum No. of Subs. Formed in any 10-year Period	Total Entries
U.S.A. & Canada	1					3				1	1			1						1				1								3	5	6	6	9
Latin America	3								4	1									3			1		3		1	1					5	5	7	9	17
Europe		1				1	1					1		2		2			2	2	3	5		2			2	1				10	12	14	18	25
Africa**				1																												-	-	-	-	-
Southwestern Asia	1												2										1									2	2	2	2	4
Australia & Japan									1						1	1						1										2	2	3	3	4
Total Regions																																22	26	32	38	59

Three-Year Entry Concentration Index $= \dfrac{22}{59} = 0.3729$

Five-Year Entry Concentration Index $= \dfrac{26}{59} = 0.4407$

Seven-Year Entry Concentration Index $= \dfrac{32}{59} = 0.5424$

Ten-Year Entry Concentration Index $= \dfrac{38}{59} = 0.6441$

Average Concentration Index $= \dfrac{0.3729 + 0.4407 + 0.5424 + 0.6441}{4} = 0.5000$

* Year 1 = 1945, Year 31 = 1975

**Africa was excluded from the computation, because there was only one entry into that area.

Table B-2

Entry Concentration Indices
(by Industry)

Industry	3-year ECI	5-year ECI	7-year ECI	10-year ECI	Average ECI
Metals	0.3415	0.4634	0.5123	0.6341	0.4878
Machinery	0.5625	0.5625	0.6875	0.6875	0.6250
Automobiles	0.6364	0.7727	0.7727	0.7727	0.7386
Electrical & Electronics	0.4571	0.5714	0.6000	0.7143	0.5857
Chemicals & Pharmaceuticals	0.3729	0.4407	0.5424	0.6441	0.5000

Table B-3

Entry Concentration Indices
(by Country or Areas)

Country or Area	3-year ECI	5-year ECI	7-year ECI	10-year ECI	Average ECI
Canada	0.2222	0.3333	0.4444	0.6667	0.4167
U.S.A.	0.2500	0.3750	0.5000	0.6250	0.4375
Brazil	0.3684	0.3684	0.4211	0.4737	0.4079
Argentina	0.2000	0.3000	0.3000	0.5000	0.3250
Mexico	0.5000	0.5000	0.6250	0.7500	0.5938
Other Latin America	0.3333	0.4444	0.5556	0.6667	0.5000
Benelux	0.2941	0.4118	0.5882	0.7647	0.5147
France	0.3077	0.4615	0.6923	0.6923	0.5385
England & Ireland	0.4286	0.4286	0.5714	0.5714	0.5000
Scandinavia	0.5000	0.6250	0.6250	0.6250	0.5938
Italy, Spain, Portugal	0.3158	0.4737	0.4737	0.5789	0.4605
Yugoslavia, Greece, Turkey	0.6667	0.8333	0.8333	0.8333	0.7917
Germany	0.2500	0.4167	0.5000	0.5000	0.4167
Austria, Switzerland	0.3333	0.4167	0.5000	0.7500	0.5000
South Africa	0.3333	0.4444	0.4444	0.5556	0.4444
Other Africa	0.2500	0.2500	0.5000	0.5000	0.3750
Australia	0.3333	0.5000	0.6667	0.8333	0.5833
Japan	0.2500	0.5000	0.5000	0.5000	0.4375
Other Asia	0.3125	0.3750	0.4375	0.5000	0.4063