FOREIGN DIRECT INVESTMENT AND THAILAND'S ECONOMIC GROWTH SINCE THE 1970'S

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ABSTRACT

Foreign direct investment in Thailand plays a critical role in narrowing the gap between inadequate domestic savings and investment. Domestic production is able to create extremely high economic growth by increasing domestic and foreign demand.

The foreign direct investment is determined by various variables. The most significant determinants are market factors such as the gross domestic product. Cost factors, and investment incentives such as the wage gap between Thailand and the investing countries, and natural resource endowments are found to be significant attractions to foreign direct investment from some sources and in some sectors. At the same time, barriers such as the tax burden and the political risk are not sufficiently significant explaining the patterns of foreign direct investment in Thailand.

As far as the sources of growth are concerned, there are differences in the contribution to economic growth of export growth, domestic demand and investments from different countries. The investments from the United States and European Community countries do not precisely support the export growth, while the investment from Japan and Asian NIC's show stronger signs of contributing to the export growth in industries which have the comparative advantage.

CHAPTER 1
INTRODUCTION

In this introductory chapter, the economic background of the Thai economy will be introduced, the importance of foreign direct investment in Thailand will be indicated, and the objectives, scope, and outline of the study will be discussed.

Economic Background of the Thai Economy

Before 1855, Thailand, called Siam, was mostly a completely independent and self-sufficient kingdom. The Kings of Thailand tried to avoid contact with Western countries. Foreign trade was primarily carried out among neighbouring Asian countries, with a comparatively small amount of trade with European countries. Thailand's exports consisted largely of unprocessed natural products like, rice, teak, sugar, and coconut oil. Meanwhile, Thailand's imports consisted mainly of manufactured consumption goods, for example, textiles[1].

Thailand's economy was dramatically opened to the West in 1855 when the Bowring Treaty was signed by a representative of Great Britain, Sir John Bowring, and King Rama IV of Thailand. Consequently, the Thai economy became a dependent economy. Production was specialised, and only a few primary commodities such as rice, tin, teak, and rubber were produced to serve foreign demand. While imports were composed of a wider range of manufactured products beside textiles.

In the 1960's Thailand had started to modernise her developing economy. Based on suggestions from the World Bank, the government shifted its emphasis to promote private

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[1] James C. Ingram, 1971, Economic Change in Thailand 1850-1970, Stanford University Press, pp. 6-26.

investment[2]. A lot more basic infrastructure was provided with the help of foreign aid, especially from the United States. Internationally, the strategy of import substitution was precisely set out in the First and the Second National Development Plans, during 1961-1966, and 1967-1971 respectively. Although the domestic manufacturing sector expanded rapidly in this decade because of tariff protection and investment incentives, it made a rather insignificant contribution to exports[3]. Exports were still composed of a narrow range of primary commodities. By the end of the 1960's, the problem of deficits in the balance of payments was very serious. This was caused by the high level of machinery and raw material importation, the stagnation of primary exports, the decline in the US military spending, and the decrease in foreign direct investment[4].

In order to eliminate the problems resulting from this strategy, an export promotion policy was outlined in the Third and the Fourth National Development Plans in the 1970's. The outward-looking strategy caused a large increase in export value and diversification. However, the increase in public foreign debt and government intervention were not favourable for the economy in this decade.

Most of the government policies have been changed since the 1980's. Policies such as the internationalisation and liberalisation of trade, devaluation and the introduction of a more flexible exchange rate of the Thai currency, the privatisation of inefficient state-owned enterprises, and the relaxation of investment conditions have led the Thai economy toward a more industrialised structure. The service sector became the dominant sector of production at 48 per cent of GDP, followed by industry at 30 per cent, while left the rest of the 22 per cent to agriculture by 1986[5]. The importation of capital goods was still high however but the growth of exports, particularly in manufactured goods, had remarkably

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[2] Surachai Traiwannakij, 1992, Ph. D. Thesis, Foreign Direct Investment in Thailand, Innsbruck University, p. 6.

[3] Rachain Chintayarangsan, 1989, *"Thailand's Expectation on Reaching NIC Status"*, in Suchart Prasith-rathsint (ed.), Thailand's National Development : Social and Economic Background, pp. 128-130.

[4] Traiwannakij, 1992, p. 7.

[5] Suchart Prasith-rathsint, 1989, *"Introduction"*, in Prasith-rathsint (ed.), p. 17.

increased. At the same time, there was an increase in foreign direct investment, especially from the late 1980's and the early 1990's. This significantly contributed to the large capital inflows in the balance of payments in place of the former foreign debts.

Table 1.1 shows the crucial changes of the Thai economy comparatively with the Republic of Korea and Malaysia. During the 1970's, Thailand's industry shared the least proportion to GDP. Unlike Korea and Malaysia, Thailand's non-agricultural sector shared less than a half of her exports. In the first half of the 1980's, the proportion of the industry increased from 21.6 per cent in the 1970's, to 26.5 per cent of GDP, and other services increased from 51.8 to 54.0 per cent. In the same period, industry and other services of Korea also increased from 29.3 and 49.0 per cent to 33.7 and 52.1 per cent respectively. However, the share of the non-agricultural sector exports of Thailand was still relatively low at 47.3 per cent, while in Korea and Malaysia it made up 92.6 and 83.5 per cent of their exports. In the late 1980's, the proportion to GDP of industry and other services of Thailand increasingly approached the proportion of Korea, at the rate of 29.8 and 54.0 per cent compared with 35.2 and 53.8 per cent respectively. Also the non-agricultural sector increased dramatically to 62.0 per cent of the exports.

Table 1.1 : Average GDP, Imports and Exports of Thailand : Compared with Selected Countries (billions of US$)

	Thailand			Republic of Korea			Malaysia		
	70-79	80-84	85-89	70-79	80-84	85-89	70-79	80-84	85-89
GDP (current prices)	15.4	35.2	56.4	25.4	73.5	146.8	9.5	27.9	36.4
Agriculture	4.1	7.2	9.1	5.5	10.4	16.1	na	na	na
Industry	3.3	9.3	16.8	7.5	24.8	51.7	na	na	na
Other Services	8.0	18.7	30.5	12.4	38.3	79.0	na	na	na
Imports	3.3	9.7	15.4	8.0	25.9	43.4	3.4	12.4	15.0
Exports	2.4	6.4	13.8	6.2	17.5	47.1	4.2	13.4	20.8
Agriculture	1.3	3.4	5.2	0.5	1.3	2.0	0.8	2.2	3.2
Non-agriculture	1.1	3.0	8.6	5.7	16.2	45.1	3.4	11.2	17.6

Source : Calculated from United Nations, Statistical Yearbook for Asia and the Pacific, 1978, 1991.

In brief, since the 1970's, when Thailand has emphasized the outward-looking strategy, her structure of production has changed into a more industrialised economy. The Thai economy has also been able to maintain a higher growth rate than many other countries with the help of a large increase in exports, particularly in manufactured goods.

Domestic savings, however, are still not adequate to support the desired high rate of investment. The country's dependence on foreign savings is needed to fill the gap between domestic savings and investment. Up to 1990 while domestic savings increased at a diminishing rate, foreign savings increased, from 3.7 per cent of GDP in the previous year, to 8.6 per cent of GDP in 1990[6]. As far as the high rate of the export growth is concerned, foreign direct investment could greatly support such growth.

[6] Bank of Thailand, 1990, Annual Economic Report 1990, p. 48.

The Importance of Foreign Direct Investment in Thailand

Arguments about the impact of foreign direct investment on the development of a developing host country have long been addressed in the literature. Optimistically, foreign direct investment is believed to be a very helpful and beneficial tool for the host country. In terms of economic aspects, it can create income and employment, as well as encouraging capital formation and technology transfers. On the other hand, foreign direct investment may be considered undesirable in the sense that it exhausts the profits and savings of local entrepreneurs, and can also introduce an inappropriate technology.

Static costs and benefits cannot by themselves justify the impact of foreign direct investment. A broader and more dynamic view of the impact of foreign direct investment is necessary. The effects of foreign direct investment vary by country, industry, and over periods of time, accompanied by linkage effects. Moreover, government policies and the absorptive capacity of a particular host country can largely determine the effects of foreign direct investment on both the domestic and the international economy.

In the case of Thailand,

> "The number and share of foreign firms with export propensities of over 50 per cent rose rapidly between 1971 and 1984, and this rise together with the large jump in export-oriented foreign manufacturing investment since 1986 will further boost foreign-exchange earnings, particularly as local content has also been increasing."[7]

In recent years, some local investors have become foreign investors themselves. Employment has also been created through labour intensive industries and increasing wages. Although the benefits of technology transfers have been debated, the increased efficiency of the local firms obviously occurs, and it brings about many opportunities to supply the linkage products. In terms of social development, the decentralisation of

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[7] Linda Y.C. Lim and Pang Eng Fong, 1991, Foreign Direct Investment and Industrialisation in Malaysia, Singapore, Taiwan and Thailand, OECD, p. 90.

industry has strictly been considered as well[8].

Furthermore, as Thailand is approaching newly industrialising country (NIC) status with her outward-looking strategy, export growth becomes a more important source of economic growth. At the same time, capital inflows play an important role in the contribution to the balance of payments as equally as merchandised exports. Hence the increase in foreign direct investment contributes to economic growth both through export growth and the balance of payments via capital inflows.

Objectives and Scope of the Study

In order to evaluate its desirability and necessity, the contribution of foreign direct investment to economic growth will be investigated. According to the hypothesis whether foreign direct investment could support economic growth dynamically, the significance of the contribution over the periods of time, from the different countries, and in the particular industries will be examined comprehensively. The impact of foreign direct investment on development and some policy implications will also be addressed. Finally, estimations and predictions regarding the determinants and impact of foreign direct investment will be carried out in statistical terms.

The study will research the roles of foreign direct investment in Thailand from the major source countries, namely, the United States, Japan, the nine countries of the European Economic Community[9], and the group of four Asian Newly Industrialising Countries which includes Taiwan, Singapore, Hong Kong, and South Korea. Those roles will be described over the periods of Thailand's Fourth (1977-1981), Fifth (1982-1986), and sixth (1987-1991) National Economic and Social Development Plans.

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[8] Lim and Fong, 1991, pp. 90-91.

[9] There is no direct investment from Greece, Ireland, and Portugal in Thailand during the period under discussion.

By definition, foreign direct investment is clearly referred to as those investments from abroad which involve some control over the management of an enterprise or a partial foreign ownership. It consists of initial investment, re-invested earnings, and other long-term capital supplied by the direct investors[10]. The *real inflows* of foreign direct investment which express the amounts the foreign investors invested in the economy are divided into three sectors: agriculture, industry, and services. Furthermore, individual industries and services will be considered.

In this study, various essential models and relevant theories will be applied in order to examine the relations among foreign direct investment, economic growth, and industrialisation in Thailand. Basically, the secondary data will be used in order to accomplish the objectives of the study. According to data availability and in an attempt to lessen the effects of any missing data, the discussion will centre on the period 1978 to 1990. First of all, the patterns of the foreign direct investment from each source will be examined by using time-series multiple regression models to find the variables which effectively and significantly determine the foreign direct investment. Secondly, the *revealed comparative advantage* (RCA), as measured by the export-performance ratio[11], will be used to evaluate the importance of the foreign direct investment in particular industries. Thirdly, the contribution of the foreign direct investment to economic growth will be expressed through the *sources of growth* model[12], which uses export growth, import substitution, and domestic demand as the contributors to economic growth. Lastly, some trade-theoretical approaches such as *the product cycle hypothesis* and *the eclectic approach*, will be used to describe the patterns of foreign direct investments and their impact.

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[10] Liansheng Wang, 1992, Foreign Direct Investment and Transnational Corporations : A Review of Trade-Theoretical Approaches, University of Oslo, pp. 4-6.

[11] The details of revealed comparative advantage will be discussed in the next chapter.

[12] As well as the sources of growth, see more details in Chapter 2.

Outline of the Study

The study consists of nine chapters. The economic background of the Thai economy has already been examined in Chapter 1. The review of relevant literatures will be discussed in Chapter 2. In Chapter 3, the framework and methodology of the study will be described. Chapter 4 will illustrate the macro models of the patterns of foreign direct investment in Thailand, revealed comparative advantage, and sources of growth of Thailand. From Chapter 5 to Chapter 8, the empirical finding of the roles of foreign direct investment from the United States, Japan, European Community countries, and the four Asian NIC countries will be examined respectively. Finally, in Chapter 9, the conclusions and some suggestions will be presented.

CHAPTER 2
REVIEW OF LITERATURE

This chapter will review the literature which is of direct relevance to the study. Various theses on the determinants of the patterns of foreign direct investment; the notion of revealed comparative advantage, and the sources of economic growth will be introduced separately. Then trade-theoretical approaches such as the product cycle and the eclectic approaches will be outlined.

Determinants of the Patterns of Foreign Direct Investment

Attempts to determine the factors and forces affecting foreign direct investment have usually been conducted by using multiple regression models. This method has been used by many researchers with either cross-section or time-series data relating to particular regions or countries. Some researchers have studied the determinants of foreign direct investment with respect to the preference of home countries, while others have emphasized the performance of host countries. The following selected studies will be used in order to select the empirical model(s) with respect to the foreign direct investment in Thailand.

1) The first study, the one by Bandera and White (1968)[13], had tried to identify the economic reasons behind U.S. private investments in Europe. They have investigated the structural characteristics of U.S. direct investments, and offered a hypothesis that the market size, as reflected in the GNP, has constituted the most important inducement to U.S. enterprises. By using time-series data, the statistical results strongly support the hypothesis that U.S. direct investments depend mainly on the growth of the markets, and income of the host European countries. GNP is a very significant variable, determining

[13] V.N. Bandera and J.T. White, 1968, *"U.S. Direct Investments and Domestic Markets in Europe"*, Economia Internationale, Vol. 21(1), pp. 117-133.

foreign direct investment in particular industries.

2) The issue of foreign direct investments from developed countries and those from developing countries in Thailand has been addressed in the empirical study of Lecraw (1977)[14]. A questionnair method had been used to collect the primary data from a sample of firms, operating in Thailand with ownership links in developed and in developing countries. The study concluded that, unlike developed countries, the foreign direct investments from developing countries had not only followed the pattern hypothesised in the product life cycle idea, but had been influenced by several additional factors as well[15]. The developing countries' firms in Thailand tend to use labour intensive technology, which is particularly suitable for small-scale production, to produce good quality, low margin, undifferentiated goods, which are able to compete on the basis of price in competitive markets. Moreover, the developing countries' firms tend to repatriate less of their profits than other developed countries' firms do.

3) The cross-section multiple regression has also been used by Agodo (1978)[16]. This study investigated U.S. private manufacturing investments in African countries. Corresponding to the propositions of U.S. firms' investments, independent variables have been determined to explain the direct investment decision. After testing statistically, the domestic market variables, such as gross domestic product, gross domestic product per capita, and population size, are found to be significant determinants. Political stability, primary infrastructure, and development planning also support such propositions. However, among cost and factor input variables, the study has demonstrated the results differently. Raw materials have a significant influence on the investment decision; while low wages, tax concessions, and tariff protection are not found to have significant associations with U.S. investments.

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[14] D. Lecraw, 1977, *"Direct Investment by Firms from Less Developed Countries"*, Oxford Economic Papers, Vol. 29(3), pp. 442-457.

[15] The details of the product life cycle, or the product cycle, will be discussed later in this chapter.

[16] O. Agodo, 1978, *"The Determinants of U.S. Private Manufacturing Investments in Africa*, Journal of International Business Studies, Vol. 9(3), pp. 95-107.

4) In the study of Root and Ahmed (1978)[17], forty-four economic, social, political, and policy variables were tested for their significance in discriminating among three groups of developing countries; designated, *"unattractive"*, *"moderately attractive"*, and *"highly attractive"*, with respect to foreign investment in manufacturing. By using multiple discriminant analysis of the data, six variables were selected as essential discriminators namely, per capita GDP, corporate tax level, ratio of exports to imports, extent of urbanisation, infrastructure (i.e. ratio of commerce, transport, and communication to GDP), and political stability (i.e. regular executive transfers). In the case of Thailand, the study also concluded that the predicted classification agreed with its original classification as a moderately attractive country.

5) After introducing the eclectic approach[18], Dunning (1981)[19] has studied the influence of variables of ownership, location, and internalisation advantages based on the eclectic approach. The study investigated both inward and outward total investment, and net investment in particular groups of countries classified by a country's GNP per capita. In general, inward investment's most powerful variables were found to have come from location advantages; i.e. natural resource endowments, environmental risk index. However, some came from the countries' own economic structure i.e. population and GNP per capita.

6) Direct investment in the United Kingdom and Singapore has been studied by Dunning (1985)[20] and Lecraw (1985)[21]. According to these studies, foreign investors tend to invest more in the industries which have the higher revealed comparative advantage, ratio of exports to imports, productivity, efficiency, and growth.

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[17] F.R. Root and A.A. Ahmed, 1978, *"The Influence of Policy Instruments on Manufacturing Direct Foreign Investment in Developing Countries,* Journal of International Business Studies, Vol. 9(3), pp. 81-93.

[18] The details of the eclectic approach will be discussed later in this chapter.

[19] J.H. Dunning, 1981, International Production and the Multinational Enterprise, George Allen & Unwin, pp. 109-141.

[20] J.H. Dunning, 1985, *"The United Kingdom"*, in J.H. Dunning (ed.), 1985, Multinational Enterprises, Economic Structure and International Competitiveness, John Wiley & Sons, pp. 13-56.

[21] D. Lecraw, 1985, *"Singapore"*, in Dunning (ed.), pp. 379-405.

7) Apart from the economic aspects, Chatterjee (1986)[22]studied foreign direct investment from the point of view of political risk. By using cross-section data of seventy-six developing countries, a variable indicating the divergence between the human resource development index (aspiration), and annual per capita income (achievement) index has been developed. The gap between the two indices represents a proxy for political risk. Moreover, the direction and perception of the change have also been used in the study.

8) In the case of Japan as a home country, Healey (1991)[23] has attempted to relate capital flows per head into a country to variables including population, GNP per capita, rate of growth of GNP per capita, exports plus imports in relation to GDP, and aid receipts per capita. Another longer-period model has been suggested in order to relate Japanese private direct investment to real effective exchange rate, the ratio of government revenue to GDP, exports plus imports, aid, aid per capita, GNP, and GNP per capita. Perhaps because of inadequate data, there are several negative signs where positive signs would have been expected. Moreover, in the case of Thailand, the regression equation explains only a small proportion of the variation of the dependent variable. Nevertheless, an expansion of the model which includes wage costs per unit of output, interest rates, inflation rates, the strength of trade-unionism, the development of financial markets, and the influence of Japanese banks, have been introduced for future studies.

9) The empirical evidence on German foreign direct investment has been studied by Agarwal, Gubitz and Nunnenkamp (1991)[24]. Some of the empirical results indicate that, firstly, the expected market growth, indicated by the ratio of gross domestic investment to GNP in the host countries, is a significant variable. Secondly, German exports to host countries stimulate German direct investment. Thirdly, the variable foreign labour costs

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[22] A. Chatterjee, 1986, Foreign Direct Investment and Political Risk, Academic Publishers.

[23] D. Healey, 1991, Japanese Capital Exports and Asian Economic Development, OECD.

[24] J.P. Agarwal, A. Gubitz and P. Nunnenkamp, 1991, Foreign Direct Investment in Developing Countries : The Case of Germany, Germany.

in contrast to the hypothesis of the industrial organisation approach[25], have a positive impact on German direct investment. Fourthly, German investors have been reluctant to respond to the changes in economic and political conditions compared with the investors from other countries.

10) Recently, a study of the determinants of foreign direct investment was carried out by Lucas (1993)[26]. This study attempted to investigate the determinants of foreign direct investment in seven Asian countries, which are major hosts to foreign direct investment, namely Indonesia, South Korea, Malaysia, Philippines, Taiwan, and Thailand. Foreign direct investment has been estimated to be less elastic with respect to the costs of capital than wages, and to be more elastic with respect to aggregate demand in export markets than domestic demand. A weak positive association was found between the size of domestic consumption spending and the rate of inbound foreign direct investment. There is also a weak positive association between foreign direct investment, and higher foreign exchange reserves coverage. Moreover, the estimates have also suggested that foreign direct investment rises with greater costs within the investor's home countries, and is affected by political stability.

Revealed Comparative Advantage

In order to link economic growth with the roles of the foreign direct investment, it is useful to study the revealed comparative advantage (RCA) of Thailand in each industry within particular sectors. Several international trade performance indicators have been developed to describe the patterns of RCA within the manufacturing sector. In this present

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[25] The details of the industrial organisation approach is discussed later in this chapter.

[26] Robert E.B. Lucas, 1993, *"On the Determinants of Direct Foreign Investment : Evidence from East and Southeast Asia,* World Development, Vol. 21(3), pp. 391-406.

study, the most common pattern of RCA, an export-performance ratio[27], will be used later. Previous studies associated with the assessment of the export-performance ratio as the RCA are summarised below.

1) Balassa (1979)[28] briefly mentioned the (relative) export performance that has been used as an indicator of comparative advantage in preference to export-import ratios or net exports. Intercountry differences in the commodity pattern of imports are greatly influenced by the system of protection applied, particularly in the case of developing countries where import barriers are high and variable from commodity to commodity. The explanation of the relative export performance concluded that the relative export performance in an individual product category is expressed as the ratio of a country's share in world exports of a particular product category to its share in world exports of all manufactured goods.

2) The United Nations Industrial Development Organization (1982)[29] has used the export performance ratio to explain the changing patterns of trade in world industry. The study has also argued that a measure of RCA involving both import and export data is likely to be biased away from the underlying comparative advantage pattern of a country because of the import policy effect. The export-performance ratio, has been used as free of the import-restriction bias, and can be expressed as:

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[27] United Nations Industrial Development Organization, 1982, Changing Patterns of Trade in World Industry : An Empirical Study on Revealed Comparative Advantage, United Nations, p. 24.

[28] Bela Balassa, 1979, *"The Changing Pattern of Comparative Advantage in Manufactured Goods*, The Review of Economics and Statistics, Vol. 61(2), pp. 259-265.

[29] UNIDO, 1982, pp. 21-27.

$$e_{ij} = (X_{ij} / X_{wj}) / (X_{im} / X_{wm}) \quad (2.1)$$

where X_{ij} = exports of industry *j* of country *i*

X_{wj} = world exports of industry *j*

X_{im} = exports of total manufactures of country *i*

X_{wm} = world exports of total manufactures.

This measure represents the ratio between the share of country *i* in world exports of industry *j* and the corresponding share of total manufacturing. A value of 1.0 indicates *"normal"* export performance of industry *j* relative to the size of country *i* as an exporter of manufactures.

Sources of Growth

In order to examine the contribution of foreign direct investment to the economic growth, it is also useful to study the sources of economic growth in the corresponding sectors. Two theses will be used as examples which apply the sources-of-growth model to Thailand.

1) Lewis (1970)[30] has used the model of the sources of growth for Pakistan. In his study, the growth of various industrial groups have been divided into three sources: domestic demand, export growth, and import substitution.

With the basic condition, that the growth of total supply equals the growth of total demand of a country, the equation can be simply expressed as follows:

$$\delta X + \delta M = \delta D + \delta E \quad (2.2)$$

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[30] Stephen R. Lewis jr., 1970, Economic Policy and Industrial Growth in Pakistan, the Pakistan Institute of Development Economics, pp. 20-22 and 42-49.

$$\text{or} \qquad \delta X = \delta D + \delta E - \delta M \qquad (2.3)$$

The change in total supply, $\delta X + \delta M$, is equal to the changes in domestic production (δX) plus imports (δM). The changes in total demand, $\delta D + \delta E$, is equal to the sum of the changes in final and intermediate domestic demand (δD), and export (or foreign) demand (δE). The change in domestic production is shown in the equation 2.3.

If imports are ignored for analytical purposes, the change in domestic production can be explained by two components: the proportion of domestic production to total supply with respect to domestic demand, and the proportion of domestic production to total supply with respect to exports. Hence, the equation of the change in domestic production becomes:

$$\delta X = U_1\delta D + U_1\delta E \qquad (2.4)$$

where U_1 equals the ratio of domestic production to total supply in year 1.

However, as far as imports are concerned, the change in domestic production may be partially induced by another component, import substitution. Therefore, the complete equation of the change in domestic production consists of three components, domestic demand, export growth, and import substitution. The equation is given by:

$$\delta X = U_1\delta D + U_1\delta E + (U_2 - U_1)Z_2 \qquad (2.5)$$

where U_2 equals the ratio of domestic production to total supply in year 2, and Z_2 equals total supply in year 2.

As shown in equation 2.5, the growth of domestic production comes from three different sources. Domestic demand and the degree of import substitution create the growth of domestic production domestically. Meanwhile, the growth of domestic production is also motivated internationally by foreign demand for a country's exports. This equation can be applied to individual industries or groups of industries over periods of time.

2) Another thesis that deals with the sources of growth has been done by the Organisation for Economic Co-operation and Development (OECD) (1992)[31]. The study focuses on the composition of the structural change in seven countries; Australia, Canada, France, Germany, Japan, the United Kingdom, and the United States. It also identifies the broad sources of change for each industry, i.e. export growth, growth in domestic demand, import substitution, and changes to the pattern of inter-industry linkages in the economy. Thus changes in a particular industry's output or employment can be decomposed by the factors that contribute to that change, such as domestic final demand expansion, export expansion, imports of final goods, imports of intermediate goods, and technology. In general, the study concludes that all countries have structural shifts in output toward the high-technology manufacturing sector. Taking cross country comparisons, the industries gaining output share in Canada, France, and Germany are also mostly export driven. By contrast, in Australia and the United States, domestic final demand is the most important factor. In the United Kingdom, it is a mix of both export growth and domestic final demand that are the important factors.

Trade-theoretical Approaches

As far as the distinction between foreign direct investment and international trade is concerned, the assumptions of classical international trade theories have been challenged. Those assumptions exclude the phenomenon of foreign direct investment whose presence is marked by the possession and control of the means of production across international boundaries[32]. The theories of foreign direct investment have been constructed to explain the origin of foreign direct investment, and its impacts on host countries. The two most common approaches are the product life cycle approach, and the eclectic approach.

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[31] The Organisation for Economic Co-operation and Development, 1992, Structural Change and Industrial Performance : A Seven Country Growth Decomposition Study, the OECD Documents, pp. 7-24.

[32] Wang, 1992, p. 13.

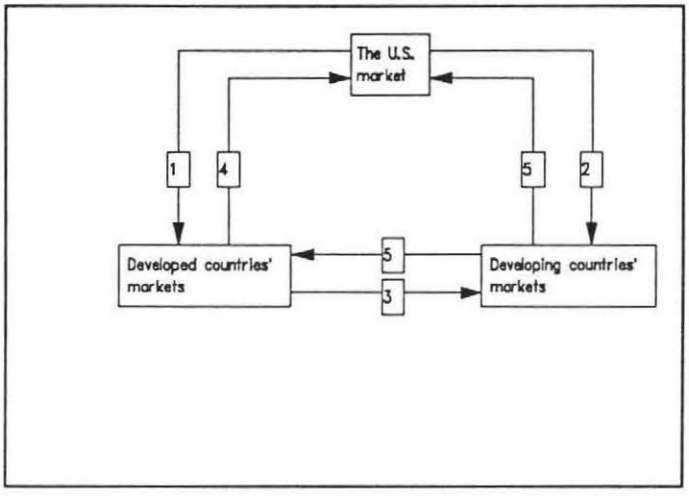
1) The product life cycle theory is basically the result of a search for unifying concepts and theoretical frameworks to understand both international trade and capital movements[33]. Wells (1972)[34] has used the product life cycle approach to explain the international trade and production of the United States rather than using traditional trade theories. From the point of view of business and marketing, the presentation of the U.S. trade position due to the product life cycle can be considered in five phases. In the first phase, the U.S. firms, say, produce a new product locally, and export to many countries. Secondly, the production is begun in a foreign market. American exports to that market do not grow as rapidly as before, or may decline. However, the exports continue to go to markets where production has not begun. Thirdly, U.S. exports to non-producing countries begin to be displaced by exports from foreign production. In the fourth phase, when the foreign production reaches such a scale of production that costs are low enough, the product is exported to the U.S. market. Finally, in the fifth phase, the developing countries become exporters of the product. In addition, these phases of the cycle belong to the stages of innovation and investment, i.e. introducing a new product, maturing the product, and its standardisation.

To sum up, the direction and the phases of the cycle can be illustrated simply with the help of Figure 2.1.

[33] Wang, 1992, p. 18.

[34] Louis T. Wells jr., 1972, *"International Trade : The Product Life Cycle Approach"*, in Louis T. Wells jr. (ed.), The Product Life Cycle and International Trade, Harvard University, pp. 3-19.

Figure 2.1 : The Product Life Cycle of the U.S. Trade Position



Kojima (1978)[35] has also summarised Vernon's product cycle theory[36] thus:

> ".....In the new phase stage, the design of the product is often changed. Hence its production is technologically unstable and the market is not yet familiar with the product. Its sales will not grow rapidly and demand for the product will remain price-inelastic.....
>
> At the growth stage, after the new-phase stage, sales of the product increase. Mass production and bulk sales methods are introduced. At the same time, entries in the industry increase and competition intensifies among producers. Demand becomes price-elastic so the sales of each firm become more responsive to price. Under these circumstances, the realisation of economies of scale and the managerial ability of the firm play important roles.
>
> Finally, when the mature stage is reached, the product becomes standardised and its production technologically stable. Instead of the decisive role played by research and development activities or managerial skills at the new phase and growth stage, unskilled and semi-skilled labour become important. Accordingly through foreign investment the production location moves to low-wage, developing countries. The costs of marketing exports of the product from these countries may

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[35] Kiyoshi Kojima, 1978, Direct Foreign Investment : A Japanese Model of Multinational Business Operations, Croom Helm, pp. 61-67.

[36] Raymond Vernon, 1966, *"International Investment and International Trade in the Product Cycle,* The Quarterly Journal of Economics, Vol. 80(2),pp. 190-207.

be low compared with other commodities, since the commodity is standardised.

.....Thus direct foreign investment is a monopolistic defence of the market and could be made before the mature stage."

Furthermore, Kojima has extended Vernon's approach to the product cycle hypothesis[37] with the help of Akamatsu's catching-up product cycle[38] which may be more suitable for developing countries. To quote Kojima again:

> ".....In a developing, or catching-up, country, the product cycle starts with imports of the new product with superior quality. 'Imports reconnoitre and map out the country's demand', and once increased demand approaches the domestic production threshold, domestic production is economical. A learning process follows and is assisted by importing technological know-how and by direct foreign investment. The expansion of production then leads to the exploitation of economies of scale, increases in productivity, improvements in quality and reductions in costs. This involves an import-substitution process. But as domestic costs reach the international competitive cost threshold, foreign markets are developed, the scale of production is extended further and costs are reduced again. Thus the expansion of exports that is originally made possible by the growth of domestic demand in its turn provides a stimulus to industrial development. In sum, it may be appropriate to call such successive development of imports, domestic production and exports the *catching-up product cycle*. It should be noted that such a product cycle takes place only for standardised, rather than new products, and in developing, rather than in industrialised, countries."

Finally, Livingstone (1989)[39] has broken the international product life cycle concept into four stages. The first stage, a significant technological breakthrough is likely to occur in one of a small number of Western technologically advanced economies. Then in the second stage, the breakthrough will spread rapidly to those others who were in the race, i.e. those who also have the technological infrastructure, generally other advanced countries. This would be the equivalent of the growth stage in the conventional product

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37 Raymond Vernon, 1971, Sovereignty at Bay : The Multinational Spread of U.S. Enterprises, Basic Book Inc., pp. 65-77.

38 Kaname Akamatsu, 1962, *"A Historical Pattern of Economic Growth in Developing Countries*, The Developing Economies, the Institute of Asian Economic Affairs, Preliminary Issue No. 1, pp. 3-25.

39 J.M. Livingstone, 1989, The Internationalization of Business, Macmillan, pp. 137-138.

life cycle. In the next stage, the product then becomes available in other developing countries-those countries which did not possess the technological infrastructure to develop the process, but which can simply reproduce a process elsewhere. This stage is equivalent to maturity in terms of the conventional life cycle. It is likely to be encouraged by host countries' policies of import substitution. In the last stage, the tide of exports is turned. The developing countries begin to export the products back to the countries of origin. The process is likely to be encouraged if access to the existing markets in the developed countries is guaranteed by the trade mark or brand name of a company already well established in such markets.

2) Dunning (1981)[40] has derived the eclectic approach to explaining the patterns of foreign direct investment. This approach attempts to set out a systematic explanation of the foreign activities of enterprises. The eclectic approach is based directly on the industrial organisation approach that deals with ownership-specific advantages of enterprises, the internalisation (transaction cost) approach that deals with their ability to internalise markets to achieve internalisation advantages, and the traditional theory of location and trade that deals with location-specific advantages[41]. In brief, the ownership-specific advantages are internal to the enterprises that use them. They consist of tangible and intangible resources, including technology which itself dictates the efficiency of resource usage. These advantages are technology, management and organisational skills, trade marks, and economies of scale. The advantages explain why a firm would choose to engage in international involvement. While the location-specific advantages are external to the enterprises, and consist of factor costs, market conditions, and host government policies. These advantages explain where the production takes place. Finally, the internalisation advantages are able to increase the benefits for the firm in terms of transaction-cost savings, and monopolistic power, rather than the sell or lease advantages to a firm located in the market. This is because the ownership-specific advantages arise not only from the exclusive possession of certain assets, but also from the ability of firms to internalise these assets to protect themselves against the failure of markets, such as

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[40] Dunning, 1981, pp. 21-69.

[41] Wang, 1992, pp. 47-49.

barriers to the transfer of technology, import controls, and inappropriately valued exchange rates. The internalisation advantages, which will explain which form of international involvement will be chosen, consist of economies of vertical integration, stability of supply at the proper price, and reduction of transaction costs.

Recently, Dicken (1992)[42] has concluded that the eclectic approach's broad-ranging quality is especially useful. The three general and interrelated principles are fundamental to an understanding of international production. The ownership-specific advantages refer to size and market power, including technology. The internalisation advantages act as an incentive for a firm, bypassing the markets which are imperfect and uncertain. Then the location-specific advantages include variations in market size and composition, the political dimension, and spatial variations in production costs.

[42] Peter Dicken, 1992, Global Shift : The Internationalization of Economic Activity, second ed., Paul Chapman, pp. 126-137.

CHAPTER 3
FRAMEWORK AND METHODOLOGY

In this chapter the framework and methodology of the study will be indicated in the early sections. After noting the limitation of the data, and explaining the economic activities used in this study, dependent and independent variables involved in the determination of the patterns of the foreign direct investment will be stated. The data and the estimation of the RCA will be expressed in the next section. The method of estimation of the sources of growth will be examined in the last section.

General Framework

In accordance with the availability of the data, and in an effort to reduce the effect of the missing data as mentioned, the data used in this study is the thirteen-year time-series data, from 1978 to 1990. This time period involves three five-year National Economic and Social Development Plans-the Fourth (1977-1981), the Fifth (1982-1986), and the Sixth (1987-1991) plans.

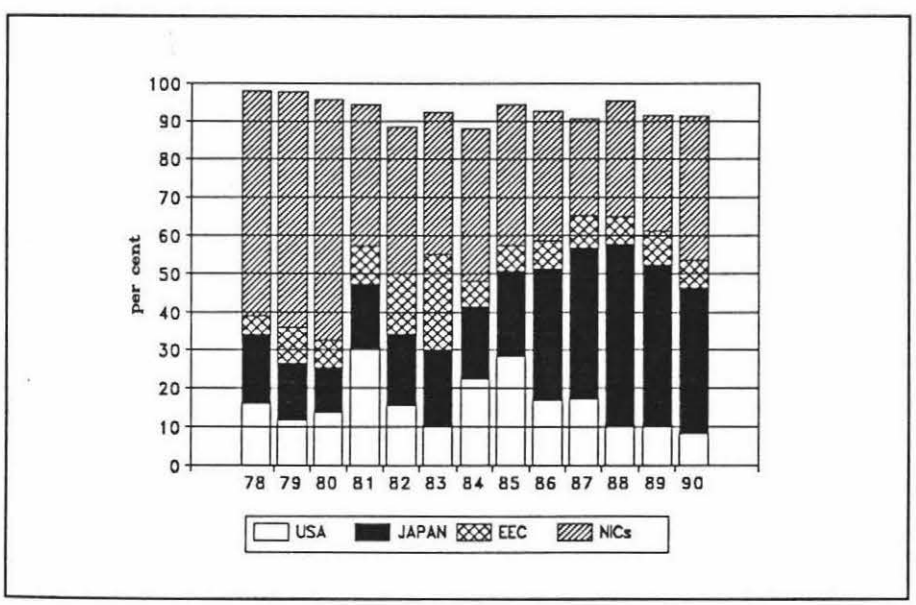
Based on the data of the inflows of foreign direct investment, economic activities will be grouped into three main sectors: the primary product, industrial, and service sector. The primary product sector consists of agricultural products, and mining and quarrying. The industrial sector includes food, textiles, metal based and non-metallic, electrical appliances, machinery and transport equipments, chemicals, petroleum products, construction materials, and other industrial products not classified above, while the service sector consists of financial institutions, trade, construction, transportation and travel, housing and real estates, hotels and restaurants, and other services not classified.

Dependent Variables

The dependent variables used in the regression models in this study are the real inflows[43] of the foreign direct investment in Thailand from major home countries. These real inflows, converted to US-dollar currency by using the average annual exchange rate[44], represent the total amounts of investment that foreign investors from particular home countries have invested in Thailand. The major sources of home countries are the United States, Japan, the nine EC countries, and the four Asian NIC countries. In addition, the real inflows per capita will be used as the dependent variables for comparisons.

The direct investment from those home countries shared more than 90 per cent of the total foreign direct investment from abroad in Thailand except in 1982 and 1984 when the share was 88.7, and 88.2 per cent respectively.

Figure 3.1 : Percentages of FDI from Selected Sources



[43] The deflators used in the conversion are taken from UN publications cited in the References at the end.

[44] The exchange rates are taken from IMF sources.

Table 3.1 : Inflows of FDI from Selected Sources (millions of US$)

Year	USA	JAPAN	EC	NICs	Others	Total
1978	50.2	56.3	16.2	184.2	5.2	312.2
	(16.1)	(18.0)	(5.2)	(59.0)	(1.7)	(100.0)
1979	34.7	43.6	28.5	181.8	5.2	293.8
	(11.8)	(14.8)	(9.7)	(61.9)	(1.8)	(100.0)
1980	61.4	52.9	32.7	283.4	18.4	448.8
	(13.7)	(11.8)	(7.3)	(63.1)	(4.1)	(100.0)
1981	124.0	68.8	40.5	150.8	22.0	406.2
	(30.5)	(17.0)	(10.0)	(37.1)	(5.4)	(100.0)
1982	64.5	78.4	66.5	160.8	47.0	417.2
	(15.5)	(18.8)	(15.9)	(38.5)	(11.3)	(100.0)
1983	63.4	117.0	155.3	226.2	44.5	606.3
	(10.5)	(19.3)	(25.6)	(37.3)	(7.3)	(100.0)
1984	140.8	118.6	42.6	249.5	73.9	625.3
	(22.5)	(19.0)	(6.8)	(39.9)	(11.8)	(100.0)
1985	108.6	85.3	26.6	140.8	20.2	381.5
	(28.5)	(22.3)	(7.0)	(36.9)	(5.3)	(100.0)
1986	68.5	139.0	29.6	137.0	28.7	402.8
	(17.0)	(34.5)	(7.4)	(34.0)	(7.1)	(100.0)
1987	86.9	198.0	42.2	127.2	45.9	500.3
	(17.4)	(39.6)	(8.4)	(25.4)	(9.2)	(100.0)
1988	129.0	622.0	91.8	397.2	57.0	1297.1
	(10.0)	(47.9)	(7.1)	(30.6)	(4.4)	(100.0)
1989	211.6	871.0	182.7	630.5	170.3	2066.1
	(10.2)	(42.2)	(8.9)	(30.5)	(8.2)	(100.0)
1990	257.5	1165.7	220.3	1152.6	259.2	3055.2
	(8.4)	(38.2)	(7.2)	(37.7)	(8.5)	(100.0)

Source : Bank of Thailand.
Values of percentage are shown in parentheses.

The data of the foreign direct investment from particular sources is shown in Table 3.1, and the percentages are illustrated in Figure 3.1. Generally, on the average, the inflows of the foreign direct investment have increased slightly since the Fourth plan period from 16.5 per cent per annum to 6.6 per cent per annum during the Fifth plan period. The increasing rate accelerated to 35.7 per cent per annum during the period of the Sixth plan.

The inflows of foreign direct investment from the United States shared around 16.3 per cent annually over these periods. Though the average of the Japanese investment was only 19.5 per cent per annum during the Fourth and the Fifth plans, 1978 to 1986, it increased sharply to 42 per cent per annum during the period of the Sixth plan. Hence the Japanese share of direct investment in Thailand has been the biggest since 1986. The smallest share in relative terms belonged to the EC countries, at around 9.7 per cent per annum. The average direct investment from the Asian NIC was more than one-half of the total direct investment during 1978 to 1981, at 55.3 per cent per annum. But the share has decreased to 34.5 per cent per annum since 1982. However, it was still the second largest proportion behind the Japanese investment since 1986.

Table 3.2 : Real FDI from Selected Home Countries Classified by Economic Sector : 1980=100 (millions of US$)

Year	USA			JAPAN		
	Prm.Pdt.	Industry	Service	Prm. pdt.	Industry	Service
1978	2.3	15.9	40.1	0.0	20.5	36.8
1979	5.9	13.1	18.8	0.1	9.1	35.2
1980	18.9	15.2	27.3	0.1	12.6	40.1
1981	22.1	65.3	26.8	0.2	17.2	51.6
1982	18.1	23.9	14.2	0.1	38.6	41.2
1983	18.4	15.6	22.2	1.7	56.2	64.0
1984	92.7	14.7	21.5	1.7	57.3	67.1
1985	11.4	26.7	64.7	0.2	22.1	69.5
1986	5.9	25.3	33.4	6.1	42.6	105.4
1987	10.6	33.9	38.6	5.9	113.8	105.1
1988	12.2	42.9	68.4	8.9	521.5	189.9
1989	13.7	106.1	83.6	16.0	602.8	397.8
1990	17.4	96.2	98.1	25.3	760.6	569.5

Table 3.2 (continued)

Year	EC			NICs		
	Prm.Pdt.	Industry	Service	Prm. pdt.	Industry	Service
1978	2.5	1.8	14.4	0.2	3.6	249.6
1979	2.9	6.3	21.6	0.5	13.6	199.9
1980	6.2	1.9	24.6	7.9	21.8	253.7
1981	6.7	14.3	16.2	1.6	8.3	129.5
1982	43.8	6.0	9.0	2.4	13.0	128.7
1983	88.7	11.0	33.2	3.8	26.8	194.3
1984	8.2	7.3	19.3	8.2	13.7	205.7
1985	3.0	8.3	9.3	5.4	13.1	110.6
1986	2.3	12.4	7.0	3.0	16.3	96.5
1987	2.2	10.6	19.1	3.0	29.3	59.3
1988	1.8	27.7	38.2	4.9	111.4	125.8
1989	1.7	52.3	80.3	10.8	136.0	191.0
1990	4.8	64.2	86.4	13.9	141.5	397.9

Source : Bank of Thailand

Furthermore, taking the real inflows of direct investment at the prices of 1980, the investors from the particular home countries invested differently in each economic sector. As shown in Table 3.2, the largest proportion of the U.S. investment was likely to be invested in the service sector. Exceptionally, in 1981, 1982, and 1989, it went to the industrial sector, and in 1984 the largest proportion belonged to the primary product sector. Secondly, the patterns of the Japanese investment in Thailand remained unchanged from 1978 to 1986. The largest proportion went to the service sector, followed by the industrial and primary product sectors. However since 1987, the first year of the Sixth plan, the industrial sector was the dominant sector for the Japanese investors rather than the service sector. Thirdly, investments from EC countries were fluctuating. In 1982 and 1983, the largest proportion of investment went to primary products, while in 1986 it went to industries. Nevertheless, in general terms the service sector was the most favoured sector for European investors in Thailand. Finally, in contrast, the pattern of direct investment

from the Asian NIC was uniform. The service sector was the dominant sector, and shared the largest proportion of their investment since 1978, and throughout the period of thirteen years.

The real investment inflows, and real inflows per capita, from each particular source will be used as the dependent variables at three levels. The first level is the whole investment from the individual source. Secondly, the real inflows of investment to the specific sectors. Finally, eighteen individual industries involved in the three main sectors will be considered.

Generally, the inflows of the investment in individual industries within sectors play a crucial role in the determination of the patterns of foreign direct investment in Thailand. These differences within the determinants will be examined in the chapters which show the results of each source of the investment flows.

Independent Variables

According to the degree of freedom of the thirteen-year observation, independent variables of the multiple regression models will be selected for each level of investment. In order to select how each of the independent variables affect investment from the selected home countries, the first ten variables are tested by turn for their relationship with foreign direct investment by using simple regression equations. Table 3.3 gives a description of the variables, and Table 3.4 outlines data of the selected variables.

Table 3.3 : Description of the Independent Variables

Variables	Description
GDP	Gross Domestic Product of Thailand[45]
GGDPR	Growth of real GDP of Thailand at 1980 prices
NAT	Natural Resource Endowments; exports of primary products per capita
URB	Urbanisation; percentage of population in urban areas
INF	Infrastructure; ratio of commerce, transport and communication to GDP
POR	Political Risk; ratio of the human development index which is the percentage of professional, technical, administrative and managerial workers to total workforce divided by per capita income
TAX	Tax Burden; percentage of tax on income and profit, plus tax on international trade and transaction less subsidies to GDP
XM	Percentage of exports to imports
XMGDP	Percentage of exports and imports to GDP
WGDP	Ratio of average wage to GDP

[45] GDP at current prices will be used instead of real GDP at constant prices because it was found to be more significant for every dependent variable.

Table 3.4 : Data on the Independent Variables[46]

Year	GDP (bil.$)	GGDPR (%)	NAT (mil.$)	URB (%)	INF (%)	POR*	TAX* (%)	XM (%)	XMGDP (%)	WGDP*
1978	23.94	9.55	63.37	13.79	0.241	na	3.39	76.28	39.32	na
1979	27.37	8.69	79.62	14.30	0.231	0.35	3.60	74.01	45.51	na
1980	31.92	12.45	91.19	14.83	0.225	0.27	3.63	68.79	49.63	1.97
1981	33.05	8.56	96.77	15.47	0.241	0.31	4.94	69.86	48.94	2.02
1982	35.65	3.65	92.50	16.13	0.243	0.32	4.06	81.24	43.46	2.04
1983	39.57	3.48	78.65	16.83	0.229	0.30	4.48	61.90	42.09	1.98
1984	35.85	-0.15	83.63	17.55	0.231	0.25	5.49	71.48	43.19	3.40
1985	38.06	0.68	68.82	18.31	0.228	0.24	4.98	76.99	43.82	3.31
1986	41.84	2.73	76.51	19.09	0.234	0.23	4.79	96.70	43.42	2.90
1987	49.99	4.70	84.44	19.91	0.230	0.21	4.57	90.20	50.72	na
1988	59.71	6.22	106.08	20.77	0.230	0.17	5.90	78.65	60.83	na
1989	69.13	5.18	126.96	21.66	0.223	na	na	77.91	66.39	2.78
1990	81.11	5.00	116.52	22.60	0.220	na	na	69.85	69.92	2.42

* Substituted mean for missing data

Together with two other variables for investment from individual sources, the percentage of exports to imports of each source (XM...), and the percentage of the average wage in Thailand to the average wage in the home country (W...)[47] seven independent variables which consist of five variables from the host country, and two variables from the home country, are used to estimate the patterns of direct investment from each source. Table 3.5 illustrates the data of those two variables from individual source countries.

[46] The data are from Thai official sources or UN sources.

[47] XM... and W... refer to the ratio of exports to imports of the home country, and the wage gap between such the country and Thailand.

Table 3.5 : The Percentage of Exports to Imports, and the Percentage of the Wage Gap of the Selected Home Countries[48]

Year	USA		JAPAN		EC		NICs	
	XM_{USA} (%)	W_{USA} (%)	XM_{JAP} (%)	W_{JAP} (%)	XM_{EEC} (%)	W_{EEC} (%)	XM_{NIC} (%)	W_{NIC} (%)
1978	77.27	6.59	122.94	5.36	96.24	7.60	82.79	26.11
1979	81.91	6.19	93.11	5.39	92.64	6.55	80.67	20.69
1980	85.91	5.91	92.38	5.42	90.57	6.10	82.82	21.74
1981	85.48	5.75	106.51	5.27	94.78	7.34	81.60	21.38
1982	83.28	5.92	105.29	6.28	94.46	8.57	83.66	25.82
1983	74.31	6.11	116.04	6.26	95.69	9.64	87.05	27.94
1984	65.65	9.17	124.60	9.34	96.96	16.17	92.91	40.43
1985	60.51	9.19	135.68	9.48	98.79	16.45	95.58	39.95
1986	59.42	8.67	165.46	6.26	101.83	11.81	100.21	30.33
1987	59.87	9.40	153.31	5.81	100.72	10.62	101.97	30.15
1988	70.03	11.45	141.40	6.39	99.16	12.49	102.25	31.87
1989	73.77	12.43	130.51	7.42	98.18	13.12	98.31	29.82
1990	76.13	12.25	122.22	7.68	96.01	12.26	93.79	26.51

By using these five variables of the host country, and two variables of the home country, the individual multiple regression equations will be estimated to represent the patterns of the direct investment from each source.

In the next step, six equations will be estimated for three economic sectors of each home country. As far as the investment in each sector is concerned, the two variables of the sectoral level, namely GDP_+, and $XMGDP_+$[49], will be used instead of the two variables of the whole country level, GDP, and XMGDP. However, in the service sector, only GDP will be replaced, whereas XMGDP will still be used due to the lack of data of exports and imports in service sector. Table 3.6 shows the data of these sectoral variables.

[48] Data sources explained previously in the text.

[49] GDP_+ and $XMGDP_+$ refer to GDP, and percentage of exports and imports to GDP of a particular sector, where the subscripts represent the primary product, industrial, and service sectors respectively.

Table 3.6 : GDP and the Percentage of Exports and Imports to GDP in Economic Sectors

Year	GDP_P (bil.$)	GDP_I (bil.$)	GDP_S (bil.$)	$XMGDP_P$ (%)	$XMGDP_I$ (%)
1978	6.68	5.07	12.19	24.21	56.61
1979	7.48	6.08	13.82	28.59	61.96
1980	8.48	7.09	16.35	28.42	70.99
1981	8.02	7.84	17.19	29.60	61.70
1982	7.91	8.35	19.39	29.26	51.25
1983	9.22	9.19	21.16	23.25	53.44
1984	7.67	8.72	19.47	25.32	51.74
1985	7.88	9.31	20.87	20.27	44.23
1986	8.14	10.94	22.84	23.07	44.72
1987	9.74	13.19	27.06	24.22	55.40
1988	11.81	16.15	31.75	26.62	67.33
1989	12.73	19.26	37.14	30.66	70.04
1990	12.97	23.04	45.09	31.48	75.40

Finally, in the particular industries within sectors, the RCA of the industries will be involved in the determination of investment. The estimation of the RCA will be stated in the next section.

Revealed Comparative Advantage

Based on the arguments of the bias of import substitution policies, the export-performance ratio will be used in order to estimate the RCA of the industries. The exportable commodities classified by three-digit SITC[50] are grouped into eleven groups of industries which belong to the two main sectors, the primary product and industrial sectors[51].

[50] Product classification corresponds to Standard International Trade Classification revised 2.

[51] See Appendix 4.

Using the formula of the export-performance ratio (equation 2.1), the exports of the industries, and the total manufacturing from both Thailand and the world exports are collected. Tables 3.7 and 3.8 show the data of export values in the primary product and industrial sectors.

Table 3.7 : Values of Exports of Primary Products (millions of US$)

Year	Agricultural Prod.		Mining	
	World	Thailand	World	Thailand
1978	112.42	2.29	82.76	0.53
1979	136.67	2.91	111.83	0.71
1980	155.58	3.23	148.74	1.03
1981	147.58	3.85	133.53	0.77
1982	132.77	3.83	123.04	0.67
1983	136.61	3.28	129.71	0.62
1984	144.36	3.63	133.34	0.60
1985	126.31	2.92	128.82	0.64
1986	141.01	3.46	125.42	0.57
1987	152.77	3.83	136.86	0.70
1988	172.09	4.87	166.54	0.91
1989	179.78	5.97	181.71	1.03
1990	188.85	5.29	188.93	1.25

Source : United Nations, International Trade Statistics Yearbook, Vol. II (trade by commodity), 1981, 1985, 1990.

Table 3.8 : Values of Exports of Industrial Goods (millions of US$)

Year	Food		Textiles		Metal Based		Elec. Appl.		Machinery	
	World	Thai.	World	Thai.	World	Thai.	World	Thai.	World	Thai.
1978	66.03	0.28	62.25	0.41	101.24	0.06	54.21	0.11	286.28	0.03
1979	81.95	0.33	76.66	0.55	123.12	0.09	63.96	0.15	330.48	0.05
1980	91.45	0.43	85.46	0.60	140.61	0.17	76.86	0.32	381.59	0.06
1981	91.68	0.55	86.17	0.69	136.18	0.14	83.56	0.31	395.79	0.06
1982	87.60	0.59	80.46	0.73	126.43	0.14	80.73	0.32	382.64	0.10
1983	86.27	0.63	81.02	0.73	117.42	0.14	87.58	0.30	376.65	0.07
1984	89.41	0.80	88.32	0.96	122.93	0.17	103.86	0.38	406.50	0.16
1985	86.81	0.91	90.83	0.96	122.94	0.17	105.21	0.03	439.17	0.25
1986	100.54	1.14	114.15	1.35	140.82	0.27	125.61	0.56	526.94	0.40
1987	119.89	1.41	141.84	2.16	160.89	0.36	151.45	0.70	628.64	0.68
1988	137.46	1.88	153.98	2.71	192.87	0.55	186.90	1.07	724.85	1.44
1989	144.63	2.04	167.66	3.33	208.71	0.67	202.10	1.68	781.07	1.83
1990	166.26	2.43	190.27	3.83	226.97	0.76	233.52	2.50	909.15	2.56

Table 3.8 (continued)

Year	Chemicals		Petroleum Prd.		Construction Mat.		Others	
	World	Thai.	World	Thai.	World	Thai.	World	Thai.
1978	105.80	0.03	145.35	0.00	15.15	0.06	89.33	0.26
1979	139.99	0.04	253.64	0.00	18.66	0.09	123.57	0.33
1980	163.50	0.05	391.48	0.00	21.50	0.10	149.63	0.43
1981	156.30	0.06	377.20	0.00	20.58	0.10	150.89	0.46
1982	147.54	0.06	321.69	0.00	18.81	0.10	142.67	0.38
1983	152.28	0.06	276.06	0.00	19.21	0.11	136.84	0.40
1984	164.77	0.08	264.51	0.00	19.54	0.12	148.36	0.46
1985	169.12	0.12	248.43	0.00	19.99	0.15	154.03	0.47
1986	202.68	0.18	157.51	0.00	25.89	0.16	191.81	0.72
1987	250.76	0.25	180.03	0.00	32.91	0.29	235.19	1.22
1988	295.38	0.32	162.72	0.00	39.40	0.39	281.43	1.77
1989	309.56	0.40	195.81	0.00	42.19	0.44	307.75	2.58
1990	348.21	0.48	229.71	0.00	51.83	0.50	340.57	3.36

Source : United Nations, International Trade Statistics Yearbook, Vol. II (trade by commodity), 1981, 1985, 1990.

The RCA of each individual industry will be illustrated in more detail in the next chapter.

Sources of Growth

The contribution of foreign direct investment to economic growth will be examined through the particular sources of growth. The sources of growth consist of export growth, import substitution, and domestic demand. To estimate these sources over the time period, the data on exports, imports, and GDP of the country are used. The data on these variables, taken from variations UN and Thai official sources, is not reproduced here.[52]. In the next chapter, the sources of growth (equation 2.5) will be calculated to examine the contribution of each source to the growth of the whole economy, as well as to that of the primary product and the industrial sectors.

With the methodology outlined above, the crucial roles of foreign direct investment from the major home countries by sector, and by industry, will be investigated in the following chapters.

[52] The sources are cited in the Reference at the end.

CHAPTER 4

THAILAND'S MACRO MODELS

In this chapter, the models of foreign direct investment, revealed comparative advantage, and sources of growth of the Thai economy will be examined according to the data and methodology as explained in the previous chapter.

The Models of Foreign Direct Investment

First of all, the ten independent (explanatory) variables are tested for significance. The significance level of these variables are shown in Table 4.1.

Table 4.1 : The Statistical Significance of Variables used to Explain FDI-F lows

	F D I (4 sources)				F D I (total)		
	Adj. R^2	F	Sig. F		Adj. R^2	F	Sig. F
GDP	.846	66.919	.0000	**GDP**	.849	68.475	.0000
XMGDP	.838	63.295	.0000	**XMGDP**	.831	60.125	.0000
NAT	.635	21.903	.0007	**NAT**	.637	22.033	.0007
URB	.558	16.136	.0020	**URB**	.564	16.496	.0019
INF	.384	8.477	.0142	**INF**	.384	8.487	.0141
POR	-.040	0.541	.4773	**TAX**	-.040	0.533	.4805
TAX	-.040	0.533	.4807	**POR**	-.042	0.519	.4863
XM	-.057	0.350	.5661	**XM**	-.058	0.342	.5705
GGDPR	-.089	0.023	.8808	**GGDPR**	-.087	0.042	.8404
WGDP	-.090	0.008	.9305	**WGDP**	-.090	0.012	.9154

Both the real inflows of the foreign direct investment from each of the four major home countries, and the real total inflows from all sources depend strongly on the same variables and in the same order. With significance at more than 90 per cent, and a positive adjusted R^2 with more than 38 per cent explanatory power, five variables are selected to be used as the independent variables of the host country. These variables are GDP, XMGDP,

NAT, URB, and INF.

Comparing the results when using the real inflows per capita as dependent variables, with the same criteria of at least 90 per cent significance, and an $R^{2\,(adj)\,or}$ 38 per cent, the same variables are found to be significant as can be seen in Table 4.2.

Table 4.2 : The Significance of Variables (using per capita inflows)

F D I per capita (4 sources)				F D I per capita (total)			
	Adj. R^2	F	Sig. F		Adj. R^2	F	Sig. F
XMGDP	.829	59.267	.0000	**GDP**	.824	57.284	.0000
GDP	.818	54.860	.0000	**XMGDP**	.822	56.596	.0000
NAT	.633	21.681	.0007	**NAT**	.636	21.990	.0007
URB	.518	13.909	.0033	**URB**	.528	14.447	.0029
INF	.377	8.267	.0151	**INF**	.377	8.275	.0151
XM	-.046	0.469	.5075	**XM**	-.048	0.453	.5146
TAX	-.050	0.426	.5272	**TAX**	-.049	0.443	.5195
POR	-.051	0.421	.5296	**POR**	-.052	0.411	.5343
GGDPR	-.090	0.004	.9501	**GGDPR**	-.089	0.017	.8978
WGDP	-.091	0.001	.9738	**WGDP**	-.091	0.003	.9554

Based on the significance of the variables, GDP which represents the market size of the country, is the most attractive variable in many cases. XMGDP, the percentage of exports and imports to GDP, which refers to the openness of the country, affects strongly the per capita inflows of the foreign direct investment from the four major sources. The product life cycle approach could be used to explain the phenomenon of direct investment from home countries developing countries to produce export goods[53]. Natural resource endowments (NAT), urbanisation (URB), and infrastructure (INF) are also sufficiently significant variables. These three variables capture the location-specific advantages referred to in the eclectic approach[54].

[53] Wells, 1972, pp. 13-14.

[54] Dunning, 1981, pp. 126-127.

Five variables which are not sufficiently significant include the percentage of exports to imports (XM), the tax burden (TAX), political risk (POR), the growth rate of real GDP (GGDPR), and the ratio of average wage to GDP. XM, as a measure of the country's import capacity[55], measures a country's external dependence. Although the values of Thailand's exports have increased steadily since the 1970's, the demand for imports, especially of capital goods, has increased dramatically in some years. TAX is not found to be very important from the foreign investors' viewpoint. The changes in taxation have not been large enough to discourage investment when considered against the advantages. In the case of Thailand, POR is probably politically liberal[56]. Unlike other developing countries, political risk does not play a negative role in foreign direct investment, in some cases a positive though low correlation could be seen. This is probably because Thailand has liberalised rules on foreign equity ownership, and opened up previously closed sectors of her economy to foreign investment[57]. GGDPR and WGDP themselves do not show any signs of significance. However, when the investment from a particular home country is concerned, the percentage of the average wage of Thailand to the home country, as a measure of the wage gap, is considerably more important.

In brief, it can be suggested that Thailand's attractiveness to foreign direct investment can change swiftly due to the results of external and regional developments, with domestic policy changes playing a more minor role[58].

Using the method of atepwise regression, and the criterion of 90 per cent confidence interval for entering an explanatory variable into the models, equations 4.1 and 4.2 express the general models of the foreign direct investment in Thailand[59].

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[55] Root and Ahmed, 1978, p. 86.

[56] Lim and Fong, 1991, p. 19.

[57] Lim and Fong, 1991, p. 30.

[58] Lim and Fong, 1991, p. 14.

[59] The values of the t-statistics are shown in parentheses. The calculated significance of t-statistics implies to the probability that the hypothesis $H_0 : ß_i = 0$, i.e. the change in a independent variable does not have an effect on the change in the dependent variable, will be accepted.

$$\text{FDI (total)} = \underset{(2.14)}{1241.07} + \underset{(7.72)}{68.34\ \text{GDP}} - \underset{(-3.75)}{194.74\ \text{URB}} \qquad (4.1)$$

adjusted R^2 = .931, F-statistics = 82.16, significance of F = .000

$$\text{FDI (4 sources)} = \underset{(2.26)}{1193.57} + \underset{(7.83)}{63.15\ \text{GDP}} - \underset{(-3.85)}{182.41\ \text{URB}} \qquad (4.2)$$

adjusted R^2 = .932, F-statistics = 83.04, significance of F = .000

In general, a pattern of foreign direct investment in Thailand is determined by the GDP of the country, together with a negative corelation with the country's urbanisation. The explanatory power of the equation is about 93 per cent at a highly significant level of confidence (significance of F=.000)[60].

Taking per capita inflows of foreign direct investment (FDI_p) as the dependent variable GDP and URB still explain the inflows well as reported in (4.3) at 92 per cent of explanatory power, and with significance of F-statistics = .000 (equation 4.3). While the foreign direct investment per capita from the four major sources depends strongly on XMGDP at 83 per cent of explanatory power, with significance of the F-statistics = .000 (equation 4.4). Once again, it is confirmed that the investment from industrialised developed countries, and newly industrialised countries are based mainly on the product life cycle approach which emphasizes exporting production in the later stages of the 'cycle'.

[60] Likewise, the calculated significance of F-statistics implies to the probability that the hypothesis $H_0 : \beta_0 = \beta_1 = \beta_2 = \ldots = 0$, i.e. the changes in independent variables do not have an effect on the change in dependent variable, will be accepted.

$$FDI_p \text{ (total)} = \underset{(2.54)}{26.88} + \underset{(7.62)}{1.23\ GDP} - \underset{(-3.92)}{3.72\ URB} \quad (4.3)$$

adjusted R^2 = .924, F-statistics = 73.71, significance of F = .000

$$FDI_p \text{ (4 sources)} = \underset{(-5.54)}{-36.74} + \underset{(7.70)}{1.01\ XMGDP} \quad (4.4)$$

adjusted R^2 = .829, F-statistics = 59.27, significance of F = .000

Furthermore, the same results are found in both the real inflows, and the real inflows per capita invested in particular sectors. Equations 4.5 - 4.10 express the models of foreign direct investment from the four major sources in the primary product, industrial, and service sectors, in terms of both the real inflows, and the real inflows per capita.

$$\text{FDI (prim prodt.)}^{61} = \underset{(2.65)}{1088.38} - \underset{(-2.00)}{3000.98\ INF} - \underset{(-4.03)}{13.13\ XMGDP} + \underset{(3.08)}{0.003\ NAT} + \underset{(2.30)}{5.82\ GDP} - \underset{(-1.45)}{13.66\ URB} \quad (4.5)$$

adjusted R^2 = .505, F-statistics = 3.45, significance of F = .069

$$\text{FDI (industrial)} = \underset{(-5.94)}{-1124.91} + \underset{(2.91)}{19.28\ XMGDP} + \underset{(2.62)}{10.03\ GDP} \quad (4.6)$$

adjusted R^2 = .939, F-statistics = 94.11, significance of F = .000

$$\text{FDI (service)} = \underset{(-3.40)}{-770.34} + \underset{(5.21)}{23.28\ XMGDP} \quad (4.7)$$

adjusted R^2 = .685, F-statistics = 27.11, significance of F = .000

[61] The criteria of entering and removing an independent variable must be widened, or the confidence must be reduced, to only 40 - 35 per cent of confidence, thus at least one variable is entered in the model.

$$FDI_p \text{ (prim. prodt.)}^{62} = \underset{(2.70)}{21.89} \underset{(-2.03)}{- 60.09\ INF} \underset{(-4.12)}{- 0.26\ XMGDP} + \underset{(3.19)}{0.0001\ NAT} + \underset{(2.28)}{0.11\ GDP} \underset{(-1.48)}{- 0.27\ URB} \quad (4.8)$$

adjusted R^2 = .514, F-statistics = 3.54, significance of F = .065

$$FDI_p \text{ (industrial)} = \underset{(-5.86)}{- 20.05} + \underset{(2.95)}{0.35\ XMGDP} + \underset{(2.50)}{0.17\ GDP} \quad (4.9)$$

adjusted R^2 = .938, F-statistics = 91.21, significance of F = .000

$$FDI_p \text{ (service)} = \underset{(-2.78)}{- 11.71} + \underset{(4.64)}{0.39\ XMGDP} \quad (4.10)$$

adjusted R^2 = .631, F-statistics = 21.55, significance of F = .001

Even though five variables explain together the change in foreign direct investment in the primary product sector, the explanatory power and the significance of the explanation are still very low compared with other sectors. The low level of explanation and significance may be due to the uneven fluctuations in the flows of investment from particular sources. The signs of some variables (INF,XMGDP) are also found to be different from the expected. This implies that the infrastructure, measured by the ratio of commerce, transport, and communication to GDP, and the openness to the world market of Thailand have negative relations to the foreign direct investment in the primary product sector. The reason for this could be that the investment in the sector from the particular sources was to produce the products to export them back to the home countries rather than to the world market.

In industrial and service sectors, however, XMGDP is the important explanatory variable influencing direct investment.

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[2] The criteria of entering and removing an independent variable is 30 25 per cent of confidence, which is a rather relaxed criterion.

The Estimation of the RCA

The model of export-performance ratio is used to indicate the RCA of the industries in this section.

Basically, the RCA of the primary product sector, although more than 1.0, decreases from 3.98 in 1978 to 2.32 in 1990, at the average rate of 4.25 per cent per annum. In contrast, the RCA of the industrial sector, although less than 1.0 increases from 0.37 in 1978 to 0.82 in 1990, at the average rate of 6.90 per cent per annum. Therefore, with this increasing trend the RCA of the industrial sector of Thailand could reach 1.0, and become a 'normal' export performer before long. The features of the RCA in the industrial sector are supported by the recent report of OECD for the first half of 1993, stating that Thailand has become the 'sixth tiger' of Asia, and still has a very high economic growth rate when compared with other countries[63]. The estimates of the RCA is illustrated in Table 4.3.

Table 4.3 : The Estimation of the RCA of Thailand

Year	Agr.Prd.	Min.	Food	Text.	Met.	El.Ap.	Mach.	Chem.	Petr.	Cons.Mat.	Oth.
1978	1.41	0.45	3.11	4.95	0.47	1.47	0.07	0.18	0.00	3.06	2.20
1979	1.46	0.44	3.02	5.35	0.55	1.74	0.11	0.23	0.00	3.50	1.95
1980	1.48	0.49	3.29	4.86	0.82	2.88	0.12	0.23	0.00	3.19	1.99
1981	1.59	0.35	3.78	5.08	0.67	2.33	0.09	0.23	0.00	3.10	1.94
1982	1.64	0.31	3.86	5.17	0.63	2.29	0.15	0.24	0.00	3.00	1.53
1983	1.64	0.33	4.03	4.93	0.65	1.85	0.10	0.22	0.00	3.04	1.59
1984	1.65	0.30	4.04	4.89	0.62	1.63	0.18	0.22	0.00	2.77	1.39
1985	1.66	0.36	4.88	4.95	0.65	1.38	0.27	0.34	0.00	3.47	1.44
1986	1.62	0.30	3.77	3.92	0.63	1.47	0.25	0.30	0.00	2.08	1.24
1987	1.60	0.33	3.16	4.08	0.60	1.25	0.29	0.27	0.00	2.35	1.40
1988	1.66	0.32	2.93	3.78	0.61	1.23	0.43	0.23	0.00	2.15	1.35
1989	1.71	0.29	2.57	3.61	0.58	1.51	0.43	0.23	0.00	1.91	1.52
1990	1.62	0.38	2.39	3.30	0.55	1.76	0.46	0.23	0.00	1.58	1.62

[63] Bangkok Business, August 2nd, 1993, Vol. 6 (1747), pp. 1-2.

It is obvious that the industries that have a comparative advantages relative to other countries (i.e. RCA>1) are agricultural products in the primary product sector, and food, textiles, electrical appliances, construction materials, and other industries (not classified) in the industrial sector. Whereas the exports of mining, metal based and non-metallic, chemicals, and petroleum products are without a comparative advantage.

The estimated values of RCA will be used as the independent variable in the tests involving the individual industries.

The Estimation of the Sources of Growth

The sources of growth as explained in equation 2.5 is used here to quantify the particular sources. Table 4.4 presents the estimates.

Table 4.4 : Sources of Growth of Thailand

Year	Export Growth	Import Substitution	Domestic Demand
1978	11.36	4.79	83.85
1979	29.30	-25.88	96.58
1980	19.99	-17.45	97.55
1981	15.05	3.40	81.55
average	18.93	-8.81	89.88
1982	4.04	55.21	40.75
1983	-10.57[64]	-18.68	129.25
1984	34.86	10.96	54.18
1985	38.18	5.39	56.43
1986	40.38	28.56	31.06
average	21.38	16.29	62.33
1987	35.24	-32.12	96.88
1988	32.78	-37.25	104.47
1989	31.45	-16.71	85.26
1990	11.45	-23.91	112.46
average	27.73	-27.50	99.77

On average, the contribution of exports to Thailand's overall growth has increased exports from 18.9 percent during the Fourth plan period (1978-1981), to 21.4 and 27.7 per cent in the next two periods of the Fifth (1982-1986), and the Sixth (1987-1990) plans. Import substitution had a negative effect during the Fourth plan period, the domestic production faced competition from imports. However, it contributed around 16 per cent of the economic growth during the Fifth plan. Then during the Sixth plan period, the growth of domestic production was again dampened by imports growing at a high rate of 27.5 per cent, due mainly to the large value of the import of capital goods. The target for the value of import growth rate in the Sixth plan period increased to 9.5 per cent compared with 2.9 per cent in the previous plan[65].

[64] The negative growth rate of Thailand's exports in 1983 is also reported in United Nations, National Accounts Statistics : Main Aggregates and Detailed Tables, various issues.

[65] Government of Thailand, 1987, The Sixth National Economic and Social Development Plan (1987-1991), p. 38.

With the same method, the sources of growth within the primary product, and industrial sector are also estimated, as shown in Table 4.5.

Table 4.5 : Sources of Growth of Primary Product and Industrial Sectors

Year	Primary Products			Industries		
	Expt. Gth.	Impt. Sub.	Domest. Demd.	Expt. Gth.	Impt. Sub.	Domest. Demd
1978	14.87	6.33	78.80	25.16	4.73	70.11
1979	95.03	-25.01	29.98	20.58	-29.19	108.61
1980	57.49	11.24	31.27	27.81	-64.60	136.79
1981	-71.41	34.51	136.90	12.26	19.59	68.15
avg.	24.00	6.77	69.24	21.45	-17.37	95.92
1982	88.93	-12.33	23.40	5.93	195.52	-101.45
1983	-41.32	-4.62	145.94	0.68	-46.28	145.60
1984	-19.17	10.77	108.40	-72.82	76.38	96.44
1985	-295.29	150.16	245.13	-5.26	160.94	-55.68
1986	169.24	-56.43	-12.81	57.89	40.63	1.48
avg.	-19.52	17.51	102.01	-2.72	85.44	17.28
1987	28.63	-19.33	90.70	61.05	-44.76	83.71
1988	31.63	-12.66	81.03	36.96	-48.60	111.64
1989	13.28	-7.91	94.63	9.59	-3.53	93.94
1990	-19.43	-30.61	150.04	18.53	-8.71	90.18
avg.	13.53	-17.63	104.10	31.53	-26.40	94.87

Taking the primary product sector, the contribution of export growth to domestic production decreased sharply in the period of the Fifth plan (1982-1986) because of a highly increasing domestic demand. In the Sixth plan period, 1987-1990, although the export growth and domestic demand increased slightly, the domestic production was still inadequate to meet the increasing domestic and foreign demand. Hence the importation of primary products was still necessary until the end of this period.

As a result of a very large decline in the contribution of exports in the industrial sector in 1984, and a small one in 1985, the contribution of exports over the Fifth plan period was negative. Yet in the next period, with the Sixth plan, export growth increased rapidly at an average rate of 31.5 per cent. Nevertheless, the imports of industrial goods still played

an important role in supporting the growth of the economy.

To sum up, foreign direct investment from the four major sources in Thailand, in terms of the real inflows, had a positive correlation with market size, and a negative one with urbanisation. In terms of the real inflows per capita, the foreign direct investment can be explained by the share of exports and imports in GDP of the country. Yet, both explanations of the real inflows and the real inflows per capita of the foreign direct investment in the primary product sector are still debatable. While in the industrial and service sectors, the explanations support the hypothesis of the contribution to the economic growth through export growth, and domestic demand in the Thai economy. These two dominant sources of growth have played the crucial roles in Thailand's economic growth during the last two decades.

The details of the investment from the individual home countries by individual industry will be discussed separately in later chapters for each country.

CHAPTER 5

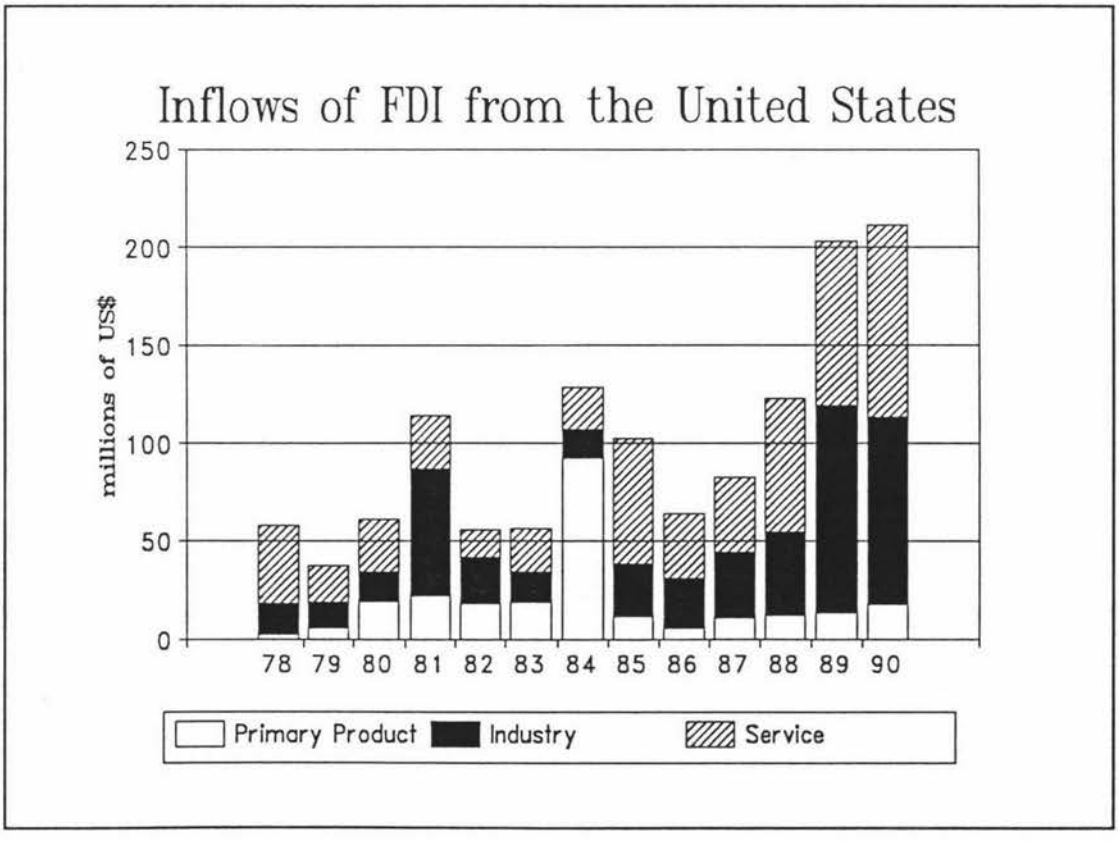
EMPIRICAL FINDINGS : THE CASE OF THE UNITED STATES

Investment from the United States will be examined in this chapter. Firstly, the overall investment will be estimated, and secondly, the investment by sector, and individual industries will be examined.

The Overall Investment

The real inflows of investment from the United States, which were around 16 per cent of the total foreign direct investment in Thailand, went into the three economic sectors: the primary product, industrial, and the service sector, in the ratios of 20, 36, and 44 per cent respectively. Figure 5.1 shows the proportions of the inflows of the direct investment from the United States in these sectors.

Figure 5.1 : Direct Investment from the United States by Sector



The differences between the estimated models of total real inflows, and the real inflows per capita from the United States are shown in equations 5.1 and 5.2 in which USA and USA_p represent the inflows, and the inflows per capita respective of direct investment,

$$USA = \underset{(-0.88)}{-21.65} + \underset{(5.30)}{2.79}\ GDP \qquad (5.1)$$

adjusted R^2 = .693, F-statistics = 28.05, significance of F = .000

$$USA_p = \underset{(-2.33)}{-2.03} + \underset{(4.63)}{0.08}\ XMGDP \qquad (5.2)$$

adjusted R^2 = .630, F-statistics = 21.43, significance of F = .001

The real inflows of the direct investment from the United States are determined by GDP with a 69 per cent explanatory power which is also statistically significant. While the real inflows per capita depend on XMGDP at 63 per cent of explanatory power which is significant at less than a 1 percent level. The details of the investment in individual industries are shown in Tables 5.1 - 5.3.

Table 5.1 : The Real Inflows of FDI from the United States in the Primary Product Sector : (millions of US$)

Year	Agricultural Products	Mining & Quarrying
1978	0.057	2.296
1979	0.000	5.857
1980	0.296	18.618
1981	0.036	22.098
1982	0.000	18.094
1983	0.799	17.635
1984	0.276	92.395
1985	1.733	9.660
1986	1.547	4.378
1987	2.722	7.900
1988	2.294	9.927
1989	1.504	12.198
1990	1.161	16.236

Source : Bank of Thailand

Table 5.2 : The Real Inflows of FDI from the United States in the Industrial Sector : (millions of US$)

Year	Food	Text.	Metal.	Elec.ap.	Mach.	Chem.	Petro.	Cons.eq.	Other
1978	0.805	0.023	0.011	8.682	0.000	1.605	4.695	0.017	0.097
1979	0.697	0.000	0.016	4.756	0.037	0.356	6.676	0.543	0.000
1980	1.740	0.848	0.339	9.816	0.189	0.097	0.024	0.000	2.157
1981	0.577	0.092	0.000	21.368	0.124	0.128	41.647	0.000	1.407
1982	1.996	0.000	1.367	19.666	0.572	0.246	0.000	0.000	0.023
1983	3.966	0.066	0.158	10.001	0.093	0.541	0.000	0.000	0.768
1984	0.971	0.064	0.310	10.442	1.497	0.512	0.000	0.000	0.907
1985	5.540	0.131	0.000	6.147	0.920	11.201	0.000	0.000	2.752
1986	7.383	0.058	0.390	5.937	0.184	8.135	0.000	0.000	3.232
1987	3.730	12.955	1.130	4.360	0.126	6.621	0.046	0.313	4.605
1988	8.179	1.945	1.490	12.023	1.263	3.367	0.004	0.789	13.847
1989	14.458	1.542	3.072	46.473	1.152	20.580	0.273	0.232	18.323
1990	4.279	1.392	3.762	32.224	2.660	37.043	0.000	0.250	14.629

Source : Bank of Thailand

Table 5.3 : The Real Inflows of FDI from the United States in the Service Sector : (millions of US$)

Year	Fin.ins.	Trade.	Const.	Trans.	Hous.	Hotel.	Other
1978	31.039	5.935	0.982	1.834	0.000	0.023	0.308
1979	12.735	2.670	0.691	0.878	0.000	0.064	1.755
1980	3.034	4.169	8.866	1.449	0.291	0.257	9.249
1981	2.793	2.340	8.761	3.715	0.060	1.090	8.055
1982	0.719	4.741	3.196	3.204	0.049	0.367	1.939
1983	1.490	11.885	3.861	2.973	0.042	0.093	1.896
1984	1.581	12.344	1.325	1.045	2.886	0.843	1.463
1985	26.145	13.516	2.642	4.674	8.690	5.899	3.104
1986	1.338	17.441	4.281	5.441	0.213	0.040	4.693
1987	1.901	21.836	5.162	1.775	0.118	0.408	7.449
1988	5.631	33.265	1.513	2.946	5.991	1.752	17.264
1989	13.358	36.535	2.889	5.369	8.004	5.785	11.689
1990	28.950	51.146	0.384	4.087	5.232	3.333	4.978

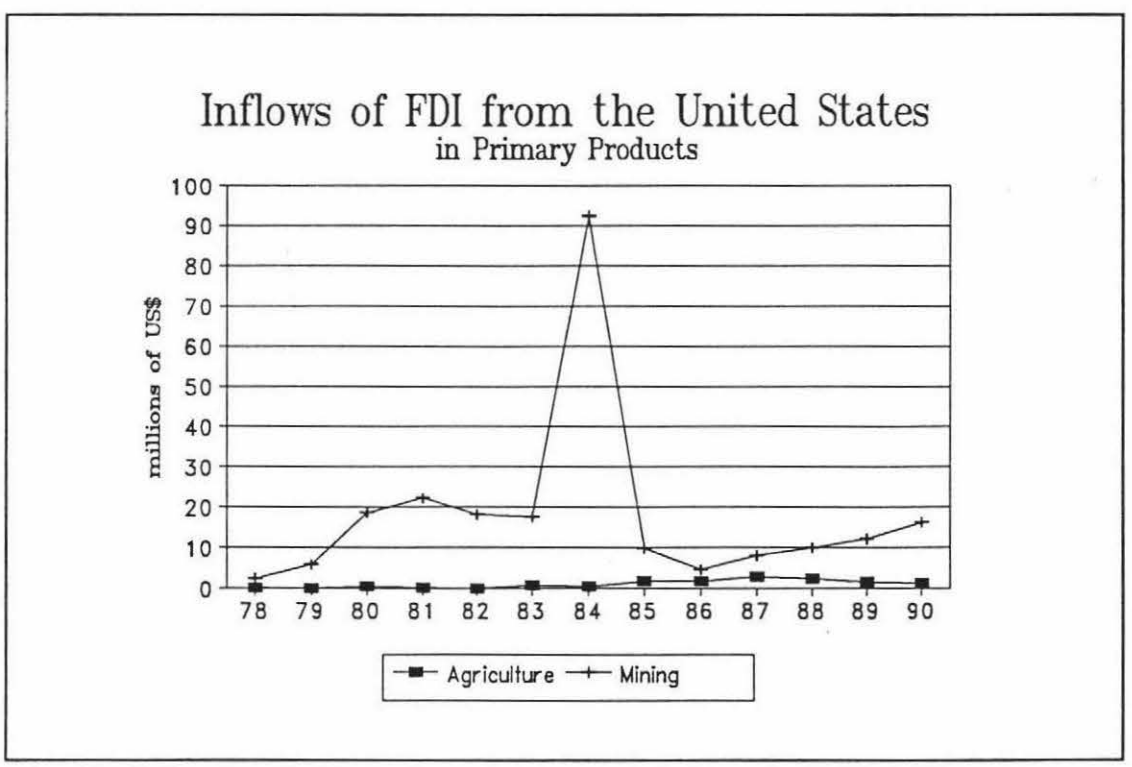
Source : Bank of Thailand

The Investment in the Primary Product Sector

On the average, investment in the primary product sector was around 16 per cent of the total investments from the United States, except in 1984, when investment in the primary product sector increased to 72 per cent of total investment. More than 99 per cent of this investment went into oil exploration in the mining and quarrying industry, which attracted huge investments in oil exploration after the second oil price shock of the late 1970s and early 1980s.

Figure 5.2 graphs the investment in the primary product sector from the United States.

Figure 5.2 : Investment in the Primary Product Sector from the United States



In the regression equations, the dependent variable is either the average investment or the average investment per capita, taking investments over the period as a whole.

The estimated models of the investment in the primary product sector from the United States are shown in equations 5.3 and 5.4. Equation 5.3 represents the estimated model of the real inflows of the investment, and equation 5.4 represents the estimated model of the real inflows per capita.

$$\begin{aligned} \text{USA (prim. prodt.)}^{66} = & -15.93 + 0.92\ \text{XMGDP} - 2.45\ \text{WGAP} \\ & (-1.32) \quad (2.45) \quad (-2.90) \\ & + 1.42\ \text{URB} \\ & (2.24) \end{aligned} \tag{5.3}$$

adjusted $R^2 = .455$, F-statistics = 4.33, significance of F = .038

$$\begin{aligned} \text{USA}_p \text{ (prim. prodt.)} = & -0.22 + 0.01\ \text{XM}_{\text{USA}} \\ & (-0.90) \quad (1.98) \end{aligned} \tag{5.4}$$

adjusted $R^2 = .197$, F-statistics = 3.94, significance of F = .073

The explanatory power and the values of the F-statistics of the estimated models of the primary product sector are relatively low when compared with the models of other sectors. Moreover, different variables are involved in the models of the real inflows and the real inflows per capita of the investment in individual industries. These models are expressed in equations 5.5 - 5.8.

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[66] The criteria of stepwise regression is 85 - 80 per cent of confidence.

$$\text{USA (agri. prodt.)} = \underset{(-0.47)}{-0.62} + \underset{(5.53)}{0.27}\ \text{URB} - \underset{(-2.96)}{0.12}\ \text{XMGDP}_P \qquad (5.5)$$

adjusted R^2 = .737, F-statistics = 17.78, significance of F = .001

$$\text{USA}_p \text{ (agri. prodt.)} = \underset{(4.73)}{0.10} - \underset{(-6.56)}{0.001}\ \text{XM}_{USA} + \underset{(4.63)}{0.01}\ \text{GDP}_P - \underset{(-2.35)}{0.003}\ \text{WGAP} \qquad (5.6)$$

adjusted R^2 = .837, F-statistics = 21.61, significance of F = .000

$$\text{USA (mining)} = \underset{(-0.85)}{-9.32} + \underset{(3.02)}{0.52}\ \text{XM}_{USA} - \underset{(-1.83)}{46.68}\ \text{RCA} \qquad (5.7)$$

adjusted R^2 = .375, F-statistics = 4.60, significance of F = .038

$$\text{USA}_p \text{ (mining)} = \underset{(-1.46)}{-0.34} + \underset{(2.50)}{0.01}\ \text{XM}_{USA} \qquad (5.8)$$

adjusted R^2 = .304, F-statistics = 6.24, significance of F = .030

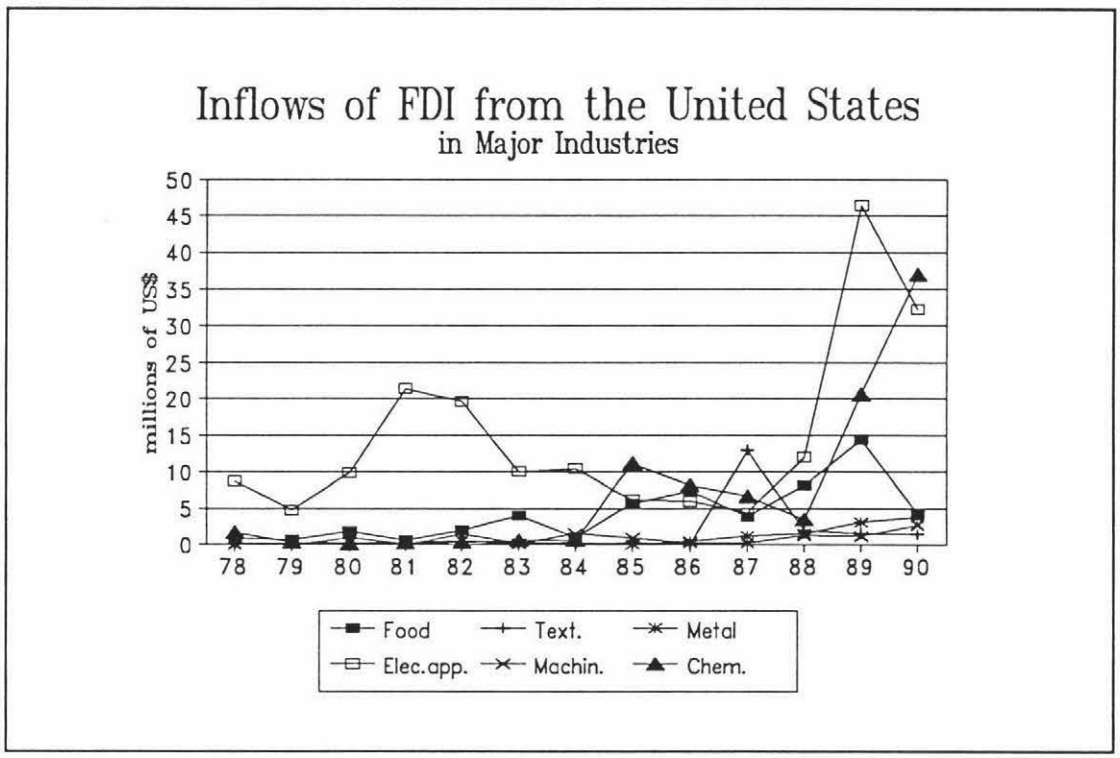
In brief, particularly when real inflows of total investment are used, the investment in the primary product sector from the United States does not favour the export growth of Thailand. The investment in agricultural products has a negative co-relation to $XMGDP_P$ (equation 5.5). Meanwhile, a negative relation between RCA and the investment in the mining and quarrying industry is also found (equation 5.7). The statistical report states that the principal exports of primary products from Thailand to the United States include rubber, tapioca products and tin[67], none of which are heavily dependent on foreign investment.

[67] Bank of Thailand, Quarterly Bulletin, various issues.

Investment in the Industrial Sector

The proportion of investment in the industrial sector to total direct investment from the United States is 36 per cent. Figure 5.3 shows the patterns of the investment in some of the major individual industries within the industrial sector.

Figure 5.3 : Patterns of Investment in the Industrial Sector from the United States



Both the real inflows and the real inflows per capita are correlated with the same explanatory variables, unlike investments in the primary sector(equations 5.9 and 5.10).

$$\text{USA (industrial)} = -93.86 + 5.29\ GDP_I + 1.00\ XM_{USA} \qquad (5.9)$$
$$(-2.26)\quad (5.78)\quad (1.95)$$

adjusted $R^2 = .725$, F-statistics = 16.84, significance of F = .001

$$USA_p \text{ (industrial)} = -1.75 + 0.09\ GDP_I + 0.02\ XM_{USA} \qquad (5.10)$$
$$(-2.12)\quad (4.98)\quad (1.97)$$

adjusted $R^2 = .661$, F-statistics = 12.71, significance of F = .002

For individual industries too GDP and XM are the two common explanatory variables of significance, apart from urbanization which is weak but statistically significant in Food, and WGAP which influences chemicals, as are shown in equation 5.11 - 5.22.

$$\text{USA (food)} = \underset{(-2.76)}{-14.04} + \underset{(3.63)}{1.02\ \text{URB}} \qquad (5.11)$$

adjusted R^2 = .504, F-statistics = 13.18, significance of F = .004

$$\text{USA}_p\ \text{(food)} = \underset{(-2.60)}{-0.24} + \underset{(3.48)}{0.02\ \text{URB}} \qquad (5.12)$$

adjusted R^2 = .481, F-statistics = 12.14, significance of F = .005

$$\text{USA (textile)}^{68} = \underset{(1.69)}{12.53} - \underset{(-1.50)}{0.15\ \text{XM}_{\text{USA}}} \qquad (5.13)$$

adjusted R^2 = .095, F-statistics = 2.25, significance of F = .161

$$\text{USA}_p\ \text{(textile)}^{69} = \underset{(1.67)}{0.23} - \underset{(-1.49)}{0.003\ \text{XM}_{\text{USA}}} \qquad (5.14)$$

adjusted R^2 = .091, F-statistics = 2.21, significance of F = .165

$$\text{USA (metal base)} = \underset{(-4.05)}{-3.94} + \underset{(10.50)}{0.23\ \text{GDP}_I} + \underset{(2.68)}{0.03\ \text{XM}_{\text{USA}}} \qquad (5.15)$$

adjusted R^2 = .900, F-statistics = 55.09, significance of F = .000

$$\text{USA}_p\ \text{(metal base)} = \underset{(-3.72)}{-0.07} + \underset{(9.48)}{0.004\ \text{GDP}_I} + \underset{(2.54)}{0.001\ \text{XM}_{\text{USA}}} \qquad (5.16)$$

adjusted R^2 = .880, F-statistics = 44.95, significance of F = .000

[68] The criteria of stepwise regression is 80 - 75 per cent level of confidence.

[69] The criteria is 80 - 75 per cent level of confidence.

$$USA \text{ (elect. app.)} = \underset{(-2.71)}{-52.07} + \underset{(4.31)}{1.83\ GDP_I} + \underset{(2.67)}{0.63\ XM_{USA}} \quad (5.17)$$

adjusted R^2 = .618, F-statistics = 10.69, significance of F = .003

$$USA_p \text{ (elect. app.)} = \underset{(-2.72)}{-0.98} + \underset{(3.87)}{0.03\ GDP_I} + \underset{(2.83)}{0.01\ XM_{USA}} \quad (5.18)$$

adjusted R^2 = .583, F-statistics = 9.39, significance of F = .005

$$USA \text{ (machinery)} = \underset{(-1.69)}{-0.58} + \underset{(4.03)}{0.11\ GDP_I} \quad (5.19)$$

adjusted R^2 = .559, F-statistics = 16.22, significance of F = .002

$$USA_p \text{ (machinery)} = \underset{(-1.43)}{-0.01} + \underset{(3.71)}{0.002\ GDP_I} \quad (5.20)$$

adjusted R^2 = .515, F-statistics = 13.77, significance of F = .003

$$USA \text{ (chemical)} = \underset{(-3.81)}{-22.95} + \underset{(2.70)}{1.10\ GDP_I} + \underset{(2.10)}{2.11\ WGAP} \quad (5.21)$$

adjusted R^2 = .786, F-statistics = 23.10, significance of F = .000

$$USA_p \text{ (chemical)} = \underset{(-3.81)}{-0.41} + \underset{(2.60)}{0.02\ GDP_I} + \underset{(2.17)}{0.04\ WGAP} \quad (5.22)$$

adjusted R^2 = .784, F-statistics = 22.76, significance of F = .000

The two other variables with a significant explanatory power are INF (in Petroleum products) and NAT (in other, undefined, industries), as expressed in equations 5.23, 5.24 5.27 and 5.28. The construction equipment sector has a weak correlation with XMGDP, as shown in equations 5.25 and 5.26.

$$\text{USA (petro. prod.)}^{70} = \underset{(-1.70)}{-172.26} + \underset{(1.74)}{762.74}\ \text{INF} \qquad (5.23)$$

adjusted R^2 = .145, F-statistics = 3.04, significance of F = .109

$$\text{USA}_p \text{ (petro. prod.)}^{71} = \underset{(-1.72)}{-3.64} + \underset{(1.76)}{16.12}\ \text{INF} \qquad (5.24)$$

adjusted R^2 = .148, F-statistics = 3.09, significance of F = .106

$$\text{USA (const. eqp.)}^{72} = \underset{(-1.28)}{-0.52} + \underset{(1.71)}{0.01}\ \text{XMGDP}_I \qquad (5.25)$$

adjusted R^2 = .139, F-statistics = 2.93, significance of F = .115

$$\text{USA}_p \text{ (const. eqp.)}^{73} = \underset{(-1.21)}{-0.01} + \underset{(1.63)}{0.0002}\ \text{XMGDP}_I \qquad (5.26)$$

adjusted R^2 = .121, F-statistics = 2.65, significance of F = .132

$$\text{USA (other)} = \underset{(-6.32)}{-10.26} + \underset{(10.84)}{1.13}\ \text{GDP}_I + \underset{(2.87)}{0.06}\ \text{NAT} \qquad (5.27)$$

adjusted R^2 = .908, F-statistics = 60.40, significance of F = .000

$$\text{USA}_p \text{ (other)} = \underset{(-6.28)}{-0.18} + \underset{(10.77)}{0.02}\ \text{GDP}_I + \underset{(3.01)}{0.001}\ \text{NAT} \qquad (5.28)$$

adjusted R^2 = .908, F-statistics = 59.93, significance of F = .000

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[70] The criteria is 85 - 80 per cent of confidence.

[71] The criteria is 85 - 80 per cent of confidence.

[72] The criteria is 85 - 80 per cent of confidence.

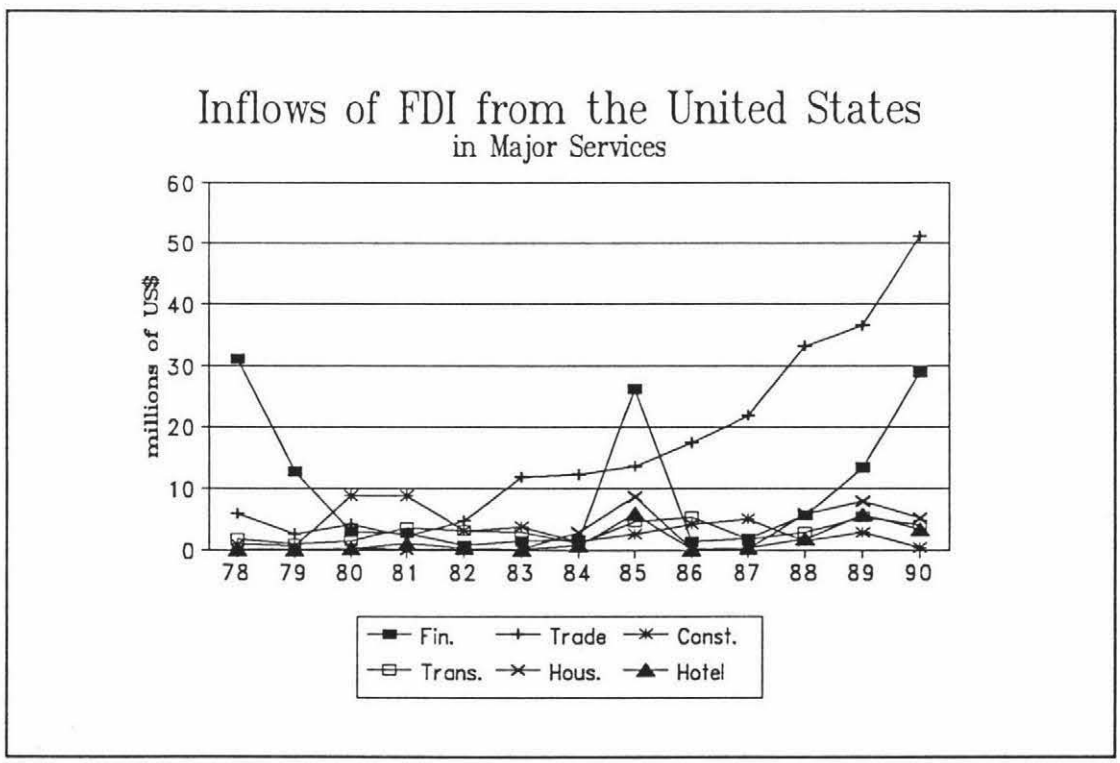
[73] The criteria is 85 - 80 per cent of confidence.

In general, direct investment from the United States in the industrial sector thus depends strongly on domestic market variables, including market size and location-specific advantages.

Investment in the Service Sector

The largest proportion of the investment from the United States, around 44 per cent, is invested in the service sector. The patterns of the investment in individual industries within the service sector are illustrated in Figure 5.4.

Figure 5.4 : Investment in the Service Sector from the United States



Labour costs, measured by the percentage of the average wage in Thailand to the average wage in the United States (WGAP), are involved in the models of both the real inflows and the real inflows per capita. However, the model of the real inflows is based mainly on the domestic market, while the external market plays a more important role in the model of the real inflows per capita. The estimated models of the investment in the service sector from the United States are shown in equations 5.29 and 5.30.

$$\begin{aligned} \text{USA (service)} = & -53.91 + 1.48\,GDP_S + 6.05\,WGAP \\ & (-3.45) \quad (2.91) \quad (2.67) \\ & + 0.26\,NAT \\ & (2.10) \end{aligned} \tag{5.29}$$

adjusted R^2 = .822, F-statistics = 19.43, significance of F = .000

$$\begin{aligned} \text{USA}_p \text{ (service)} = & -1.17 + 0.11\,WGAP + 0.02\,XMGDP \\ & (-3.10) \quad (2.40) \quad (2.27) \end{aligned} \tag{5.30}$$

adjusted R^2 = .714, F-statistics = 16.02, significance of F = .001

Nevertheless, the same determinants of the direct investment in individual industries are found in the estimated equations of both the real inflows and the real inflows per capita (equations 5.31 - 5.44).

$$\begin{aligned} \text{USA (financ. inst.)} = & 10.31 + 5.44\,WGAP - 2.58\,URB \\ & (0.65) \quad (3.26) \quad (-2.04) \end{aligned} \tag{5.31}$$

adjusted R^2 = .423, F-statistics = 5.41, significance of F = .026

$$\begin{aligned} \text{USA}_p \text{ (financ. inst.)} = & 0.36 + 0.11\,WGAP - 0.06\,URB \\ & (1.14) \quad (3.34) \quad (-2.44) \end{aligned} \tag{5.32}$$

adjusted R^2 = .432, F-statistics = 5.57, significance of F = .024

$$\begin{aligned} \text{USA (trade)} = & -25.16 + 1.34\,GDP_S + 1.26\,WGAP \\ & (-7.47) \quad (10.32) \quad (2.21) \end{aligned} \tag{5.33}$$

adjusted R^2 = .963, F-statistics = 157.04, significance of F = .000

$$USA_p \text{ (trade)} = \underset{(-6.56)}{-0.42} + \underset{(9.34)}{0.02\ GDP_s} + \underset{(2.11)}{0.02\ WGAP} \quad (5.34)$$

adjusted R^2 = .956, F-statistics = 130.83, significance of F = .000

$$USA \text{ (construct.)} = \underset{(3.70)}{9.88} - \underset{(-2.49)}{0.77\ WGAP} \quad (5.35)$$

adjusted R^2 = .302, F-statistics = 6.20, significance of F = .030

$$USA_p \text{ (construct.)} = \underset{(3.82)}{0.21} - \underset{(-2.65)}{0.02\ WGAP} \quad (5.36)$$

adjusted R^2 = .335, F-statistics = 7.04, significance of F = .022

$$USA \text{ (trans.\& trav.)} = \underset{(-1.02)}{-2.48} + \underset{(2.29)}{0.31\ URB} \quad (5.37)$$

adjusted R^2 = .260, F-statistics = 5.23, significance of F = .043

$$USA_p \text{(trans.\& trav.)}^{74} = \underset{(-0.51)}{-0.02} + \underset{(1.76)}{0.005\ URB} \quad (5.38)$$

adjusted R^2 = .149, F-statistics = 3.11, significance of F = .106

$$USA \text{ (housing)} = \underset{(-2.28)}{-6.55} + \underset{(3.22)}{1.07\ WGAP} \quad (5.39)$$

adjusted R^2 = .439, F-statistics = 10.38, significance of F = .008

$$USA_p \text{ (housing)} = \underset{(-2.16)}{-0.12} + \underset{(3.08)}{0.02\ WGAP} \quad (5.40)$$

adjusted R^2 = .414, F-statistics = 9.47, significance of F = .010

[74] The criteria is 85 - 80 per cent of confidence.

$$\text{USA (hotel \& rest.)} = \underset{(-2.09)}{-3.94} + \underset{(3.00)}{0.65}\ \text{WGAP} \qquad (5.41)$$

adjusted R^2 = .399, F-statistics = 8.98, significance of F = .012

$$\text{USA}_p\ \text{(hotel \& rest.)} = \underset{(-1.91)}{-0.07} + \underset{(2.79)}{0.01}\ \text{WGAP} \qquad (5.42)$$

adjusted R^2 = .361, F-statistics = 7.79, significance of F = .017

$$\text{USA (other)} = \underset{(-2.84)}{-13.11} + \underset{(3.30)}{0.30}\ \text{XMGDP} + \underset{(2.66)}{0.09}\ \text{NAT} \qquad (5.43)$$

adjusted R^2 = .614, F-statistics = 10.55, significance of F = .003

$$\text{USA}_p\ \text{(other)} = \underset{(-2.63)}{-0.23} + \underset{(3.06)}{0.005}\ \text{XMGDP} + \underset{(2.90)}{0.002}\ \text{NAT} \qquad (5.44)$$

adjusted R^2 = .612, F-statistics = 10.45, significance of F = .004

As far as the individual industries within the service sector are concerned, the capital intensive technique of production (URB) is considered in many industries, except construction which, with its low labour costs, (WGAP) attract investment, as seen from (equations 5.35 and 5.36). Thus, the importance of the external market is reflected only in the models of other services not classified (equations 5.43 and 5.44).

To sum up, although the importance of the external market, and the contribution to the export growth are found in a few of the individual industries, direct investment from the United States contributes largely to the domestic demand of Thailand, especially in the industrial sector. In the primary product sector, the explanation of the patterns of investment indicates that the products are probably exported back to the home country rather than to the world market. In the service sector, urbanisation plays a dominant role in investment.

CHAPTER 6

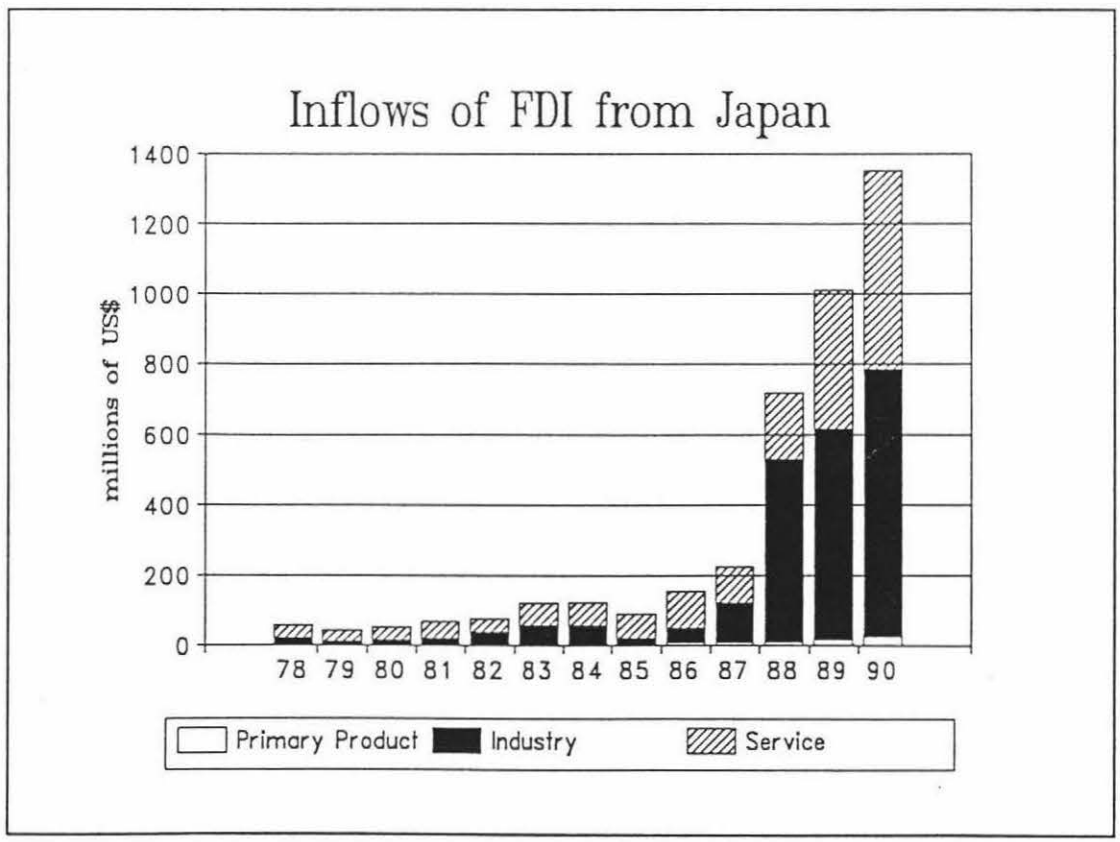
EMPIRICAL FINDINGS : THE CASE OF JAPAN

The overall patterns of investment, and investments in individual industries from Japan will be examined in this chapter. Both total real inflows and real inflows per capita of direct investment from Japan have the same explanatory variables in every individual industry. The explanatory power, and the statistical significance of the co-efficient are relatively high compared with those for the other countries. It is the industrial sector that has attracted the largest proportion of Japanese investment in Thailand, although, the service sector too had received large amounts of Japanese investment in the earlier part of the period under study.

The Overall Patterns of Investment

Japanese investments in Thailand are large, and rank second (behind Asian NIC's) among the four foreign investors in this study. the destination-by-sector of the total investment is illustrated in figure 6.1.

Figure 6.1 : Direct Investment from Japan by Sector



Equations 6.1 and 6.2 represent the estimated models of the direct investment from Japan, where JAP and JAP_p refer to the real inflows, and the real inflows per capita of the investment respectively.

$$\begin{aligned} JAP = \; & 211.49 + 42.29\ GDP - 116.12\ URB \\ & (0.80) \quad (9.57) \quad (-4.29) \\ & + 46.21\ WGAP \\ & (2.15) \end{aligned} \qquad (6.1)$$

adjusted R^2 = .964, F-statistics = 109.20, significance of F = .000

$$\begin{aligned} JAP_p = \; & 3.92 + 0.75\ GDP - 2.05\ URB \\ & (0.81) \quad (9.31) \quad (-4.15) \\ & + 0.81\ WGAP \\ & (2.06) \end{aligned} \qquad (6.2)$$

adjusted R^2 = .962, F-statistics = 103.65, significance of F = .000

Direct investment from Japan is positively correlated with Thai GDP and WGAP and negatively with urbanisation, with an adjusted R^2 = .964, and F-statistics = 109.20 for the model of total real inflows, and an adjusted R^2 = .962, and F-statistics = 103.65 for the model of real inflows per capita. The independent variables which determine the investment from Japan in the individual industries are reported later in the chapter. Real inflows of the investment in the individual industries are shown in Tables 6.1 - 6.3.

Table 6.1 : The Real Inflows of FDI from Japan in the Primary Product Sector : 1980=100 (millions of US$)

Year	Agricultural Products	Mining & Quarrying
1978	0.000	0.025
1979	0.090	0.040
1980	0.073	0.082
1981	0.161	0.035
1982	0.102	0.013
1983	1.545	0.204
1984	1.653	0.051
1985	0.194	0.000
1986	6.057	0.089
1987	5.896	0.000
1988	8.630	0.289
1989	15.998	0.000
1990	25.334	0.000

Source : Bank of Thailand

Table 6.2 : The Real Inflows of FDI from Japan in the Industrial Sector : 1980=100 (millions of US$)

Year	Food	Text.	Metal.	Elec.ap.	Mach.	Chem.	Petro.	Cons.eq.	Other
1978	2.18	9.92	1.41	1.11	2.28	2.47	0.61	0.00	0.51
1979	0.57	0.03	1.32	1.88	2.44	1.72	0.06	0.00	1.10
1980	1.10	0.16	1.60	1.39	3.96	3.55	0.08	0.00	0.75
1981	2.78	0.09	2.69	2.57	3.77	4.74	0.03	0.21	0.31
1982	1.65	17.33	9.27	4.33	3.97	1.69	0.02	0.11	0.22
1983	1.97	0.77	39.97	1.34	10.26	1.64	0.00	0.14	0.10
1984	1.29	26.15	1.12	23.06	1.14	4.56	0.00	0.00	0.00
1985	5.92	1.13	5.77	4.84	0.87	3.25	0.00	0.21	0.10
1986	4.80	3.18	1.11	13.74	2.08	2.55	0.00	0.00	15.09
1987	2.63	2.19	30.18	37.99	7.53	16.54	0.00	0.07	16.68
1988	16.98	23.10	95.78	215.71	27.87	20.83	93.12	0.19	27.89
1989	21.50	17.35	126.37	273.71	45.67	60.35	1.17	1.03	55.68
1990	39.33	20.82	93.44	335.43	104.60	64.23	46.92	0.02	55.77

Source : Bank of Thailand

Table 6.3 : The Real Inflows of FDI from Japan in the Service Sector : 1980=100 (millions of US$)

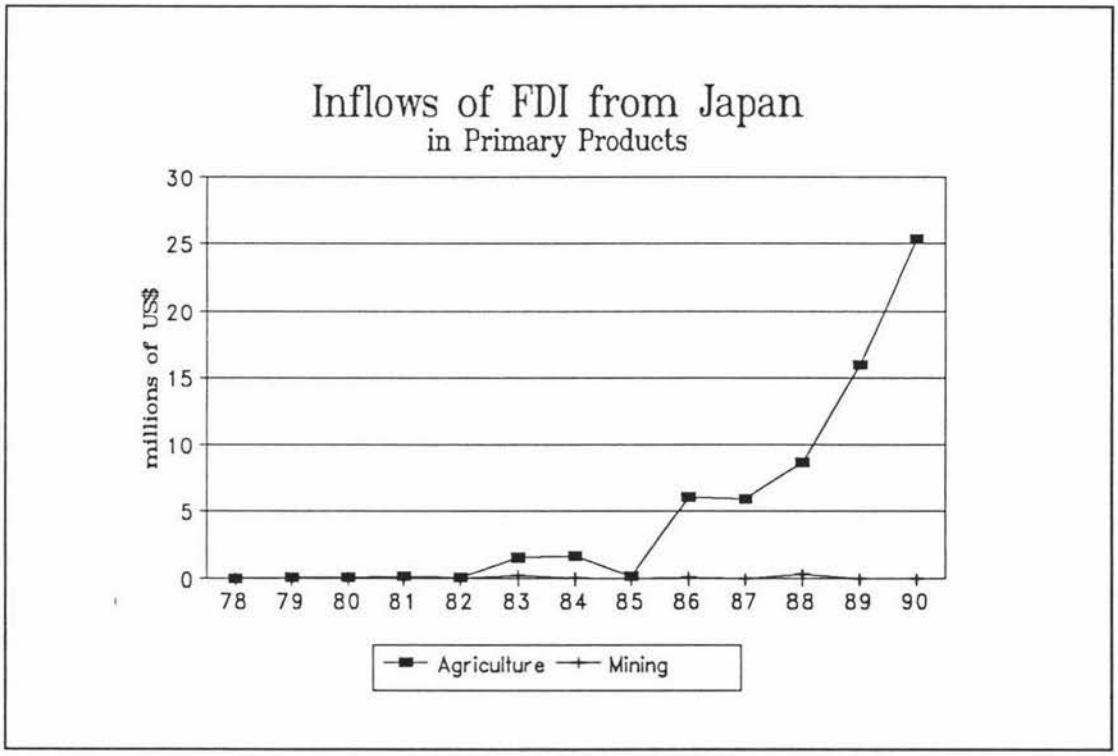
Year	Fin.ins.	Trade.	Const.	Trans.	Hous.	Hotel.	Other
1978	22.83	8.37	3.03	1.49	0.49	0.00	0.57
1979	15.54	8.24	9.26	1.88	0.00	0.00	0.24
1980	1.03	18.47	17.30	2.03	0.19	0.00	1.12
1981	0.41	10.89	38.14	0.66	0.00	0.00	1.53
1982	0.00	10.85	28.50	0.89	0.00	0.00	0.97
1983	11.77	22.15	29.01	0.43	0.00	0.00	0.62
1984	0.01	35.64	30.79	0.14	0.00	0.00	0.55
1985	1.81	22.66	36.04	4.03	0.00	0.33	4.62
1986	2.78	50.66	41.33	2.84	0.19	0.05	7.59
1987	20.34	30.56	40.28	1.59	7.99	0.00	4.32
1988	23.03	56.79	63.40	7.07	12.50	14.82	12.28
1989	27.45	96.08	122.51	6.71	32.85	81.06	31.19
1990	62.59	159.02	109.37	14.50	101.67	83.53	38.84

Source : Bank of Thailand

Investment in the Primary Product Sector

Direct investment in the primary product sector is only around 1 per cent of the total direct investment from Japan. Unlike the other countries, the larger proportion, around 82 per cent of the investment in this sector, goes to agricultural products. The rest is invested in mining and quarrying. Figure 6.2 shows the patterns of the investment in primary product sector from Japan.

Figure 6.2 : Investment in the Primary Product Sector from Japan



Equations 6.3 and 6.4 represent the estimated equations for the real inflows and the real inflows per capita of the investment in the primary product sector from Japan.

$$\text{JAP (prim. prodt.)} = \underset{(-5.55)}{-23.20} + \underset{(7.87)}{3.43\ GDP_P} - \underset{(-2.07)}{0.07\ NAT} \qquad (6.3)$$

adjusted R^2 = .837, F-statistics = 31.77, significance of F = .000

$$\text{JAP}_p \text{ (prim. prodt.)} = \underset{(-5.61)}{-0.41} + \underset{(8.00)}{0.06\ GDP_P} - \underset{(-2.10)}{0.001\ NAT} \qquad (6.4)$$

adjusted R^2 = .841, F-statistics = 32.80, significance of F = .000

In each model, an unexpected negative relation between the investment and natural resource endowments (NAT) is found. An increase in NAT, measured by the change in the exports of primary product goods, reduces investment. The relation still exists when investment in agricultural products is examined. The models of the individual industries in this sector are shown in equations 6.5 - 6.8. In these equations, RCA is also 'accepted' explanatory variable, which, too, has a negative correlation. This could be due to the fact that the specific areas of Thai agricultural sector which are attracting most of the investments are the ones that are yet to emerge as export sectors, while the established exporters, with high RCA's, are largely the traditional areas of agriculture with indigenous involvements and advantages, and little dependence on foreign invesment.

$$\text{JAP (agri. prodt.)} = \underset{(0.54)}{9.01} + \underset{(8.23)}{3.99\ GDP_P} - \underset{(-2.91)}{0.09\ NAT} - \underset{(-1.97)}{22.77\ RCA} \qquad (6.5)$$

adjusted R^2 = .870, F-statistics = 27.75, significance of F = .000

$$\text{JAP}_p \text{ (agri. prodt.)} = \underset{(0.47)}{0.14} + \underset{(8.22)}{0.07\ GDP_P} - \underset{(-2.90)}{0.002\ NAT} - \underset{(-1.90)}{0.39\ RCA} \qquad (6.6)$$

adjusted R^2 = .870, F-statistics = 27.88, significance of F = .000

$$JAP\ (mining)^{75} = \underset{(0.31)}{0.01} + \underset{(1.22)}{0.001\ NAT} \qquad (6.7)$$

adjusted R^2 = .040, F-statistics = 1.50, significance of F = .246

$$JAP_p\ (mining)^{76} = \underset{(0.36)}{0.0003} + \underset{(1.26)}{0.00002\ NAT} \qquad (6.8)$$

adjusted R^2 = .046, F-statistics = 1.58, significance of F = .234

The results could imply that one of the purposes of the investment in agricultural products by the Japanese investors is to produce in order to export back to Japan rather than to the world market. This conclusion could be supported by the direction of trade of the agricultural products which indicates that Japan increased her importation of agricultural products from the developing countries of Southeast Asia,including Thailand rapidly during 1979 - 1980, and 1987 - 1989[77]. The principal established exports from Thailand to Japan of agricultural products include rubber, maize, tapioca products and prawns[78].

It is obvious that the direct investment from Japan in the primary product sector does not significantly contribute to the economic growth of Thailand in terms of the small amount of investment, and the direction of the production.

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[75] The criteria is 75 - 70 per cent of confidence.

[76] The criteria is 75 - 70 per cent of confidence.

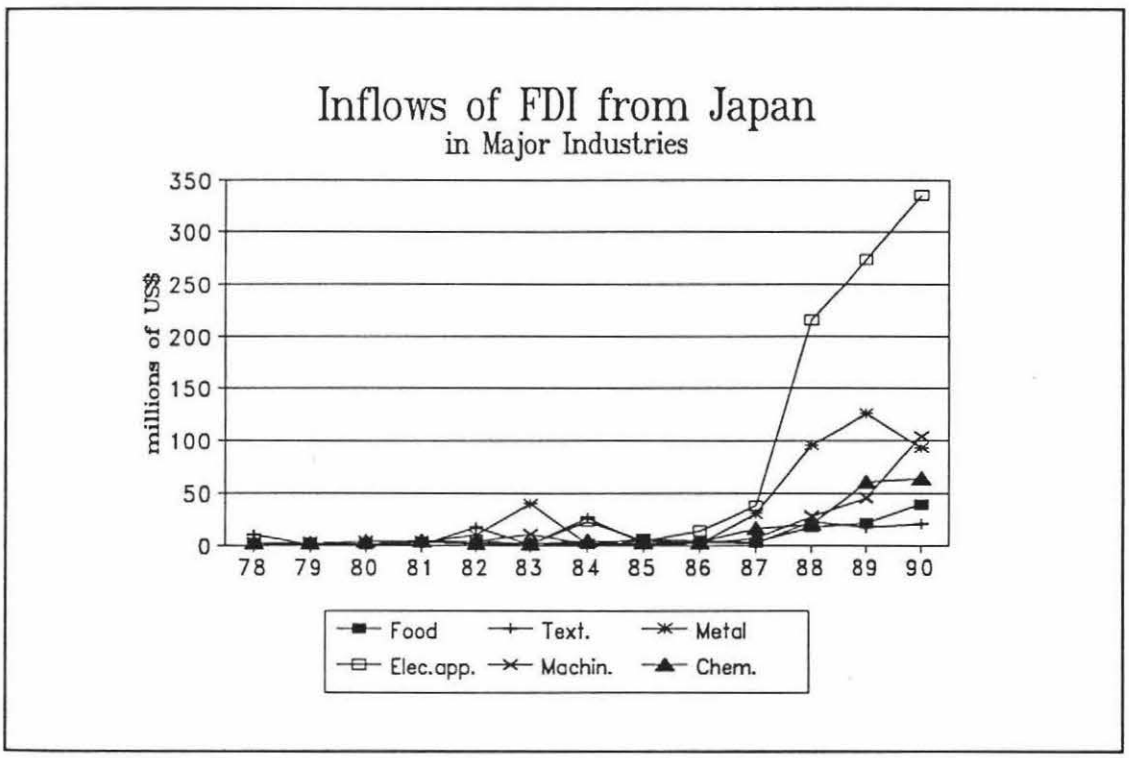
[77] The percentages by destination of the exported agricultural products from Asian developing countries are shown in Appendix 5.

[78] Bank of thailand, Quarterly Bulletin, various issues.

Investments in the Industrial Sector

The average percentage of the investment in the industrial sector to total direct investment from Japan over the period was 41 per cent. The proportion increased to more than a half of the whole investment since 1987. The figures for investment in the major individual industries are shown in Figure 6.3

Figure 6.3 : Investment in the Industrial Sector from Japan



The differences found between total model of real inflows and the real inflows per capita are shown in equations 6.9 and 6.10.

$$JAP\ (industrial) = \underset{(1.51)}{379.50} + \underset{(7.07)}{76.59\ GDP_I} - \underset{(-2.93)}{59.27\ URB} \qquad (6.9)$$

adjusted R^2 = .936, F-statistics = 88.62, significance of F = .000

$$JAP_p\ (industrial) = \underset{(-5.39)}{-11.71} + \underset{(9.19)}{0.72\ GDP_I} + \underset{(2.81)}{0.12\ XMGDP_I} \qquad (6.10)$$

adjusted R^2 = .932, F-statistics = 82.82, significance of F = .000

In every individual industry, the model of the real inflows and the real inflows per capita have the same explanatory variables, and also similar values of adjusted R^2, and significance of F-statistics. The estimated models of the real inflows, and the real inflows per capita of the investment in the individual industries are shown in equations 6.11 - 6.28.

$$JAP\ (food) = \underset{(2.08)}{24.08} + \underset{(7.21)}{3.91\ GDP_I} - \underset{(-3.78)}{4.00\ URB} + \underset{(2.02)}{1.65\ WGAP} \qquad (6.11)$$

adjusted R^2 = .927, F-statistics = 51.76, significance of F = .000

$$JAP_p\ (food) = \underset{(2.04)}{0.43} + \underset{(6.98)}{0.07\ GDP_I} - \underset{(-3.66)}{0.07\ URB} + \underset{(1.96)}{0.03\ WGAP} \qquad (6.12)$$

adjusted R^2 = .922, F-statistics = 48.60, significance of F = .000

$$JAP\ (textile) = \underset{(-0.23)}{-1.37} + \underset{(2.01)}{0.97\ GDP_I} \qquad (6.13)$$

adjusted R^2 = .202, F-statistics = 4.04, significance of F = .069

$$JAP_p\ (textile)^{79} = \underset{(0.02)}{0.002} + \underset{(1.68)}{0.02\ GDP_I} \qquad (6.14)$$

adjusted R^2 = .131, F-statistics = 2.81, significance of F = .122

[79] The criteria is 85 - 80 per cent of confidence.

$$JAP \text{ (metal base)} = \underset{(-4.58)}{-70.42} + \underset{(7.66)}{7.55\ GDP_I} + \underset{(2.13)}{0.41\ NAT} \quad (6.15)$$

adjusted R^2 = .830, F-statistics = 30.30, significance of F = .000

$$JAP_p \text{ (metal base)} = \underset{(-4.32)}{-1.25} + \underset{(7.28)}{0.13\ GDP_I} + \underset{(2.07)}{0.01\ NAT} \quad (6.16)$$

adjusted R^2 = .815, F-statistics = 27.46, significance of F = .000

$$JAP \text{ (elect. app.)} = \underset{(-5.79)}{-312.66} + \underset{(9.22)}{17.95\ GDP_I} + \underset{(2.99)}{3.13\ XMGDP_I} \quad (6.17)$$

adjusted R^2 = .933, F-statistics = 85.30, significance of F = .000

$$JAP_p \text{ (elect. app.)} = \underset{(-5.67)}{-5.58} + \underset{(9.11)}{0.32\ GDP_I} + \underset{(2.93)}{0.06\ XMGDP_I} \quad (6.18)$$

adjusted R^2 = .932, F-statistics = 82.92, significance of F = .000

$$JAP \text{ (machinery)} = \underset{(3.62)}{105.72} + \underset{(8.53)}{11.65\ GDP_I} \underset{(-5.19)}{-13.82\ URB} + \underset{(1.90)}{3.90\ WGAP} \quad (6.19)$$

adjusted R^2 = .930, F-statistics = 54.29, significance of F = .000

$$JAP_p \text{ (machinery)} = \underset{(3.77)}{1.93} + \underset{(8.71)}{0.21\ GDP_I} \underset{(-5.32)}{-0.25\ URB} + \underset{(1.87)}{0.07\ WGAP} \quad (6.20)$$

adjusted R^2 = .932, F-statistics = 56.15, significance of F = .000

$$JAP \text{ (chemical)} = \underset{(1.85)}{44.87} + \underset{(6.50)}{6.81}\ GDP_I - \underset{(-3.04)}{5.96}\ URB \qquad (6.21)$$

adjusted R^2 = .914, F-statistics = 64.52, significance of F = .000

$$JAP_p \text{ (chemical)} = \underset{(1.85)}{0.82} + \underset{(6.35)}{0.12}\ GDP_I - \underset{(-2.99)}{0.11}\ URB \qquad (6.22)$$

adjusted R^2 = .909, F-statistics = 61.25, significance of F = .000

$$JAP \text{ (petro. prod.)} = \underset{(-1.42)}{-22.17} + \underset{(2.34)}{2.98}\ GDP_I \qquad (6.23)$$

adjusted R^2 = .271, F-statistics = 5.46, significance of F = .039

$$JAP_p \text{ (petro. prod.)} = \underset{(-1.39)}{-0.40} + \underset{(2.30)}{0.05}\ GDP_I \qquad (6.24)$$

adjusted R^2 = .264, F-statistics = 5.30, significance of F = .042

$$JAP \text{ (const. eqp.)}^{80} = \underset{(-0.64)}{-0.11} + \underset{(1.71)}{0.02}\ GDP_I \qquad (6.25)$$

adjusted R^2 = .138, F-statistics = 2.92, significance of F = .116

$$JAP_p \text{ (const. eqp.)}^{81} = \underset{(-0.56)}{-0.002} + \underset{(1.65)}{0.0004}\ GDP_I \qquad (6.26)$$

adjusted R^2 = .125, F-statistics = 2.71, significance of F = .128

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[80] The criteria is 85 - 80 per cent of confidence.

[81] The criteria is 85 - 80 per cent of confidence.

$$JAP\ (other) = -52.72 + 4.03\ GDP_I + 13.13\ RCA \quad (6.27)$$
$$(-4.36)\quad (12.12)\quad (2.18)$$

adjusted R^2 = .931, F-statistics = 81.67, significance of F = .000

$$JAP_p\ (other) = -0.92 + 0.07\ GDP_I + 0.23\ RCA \quad (6.28)$$
$$(-4.08)\quad (11.59)\quad (2.01)$$

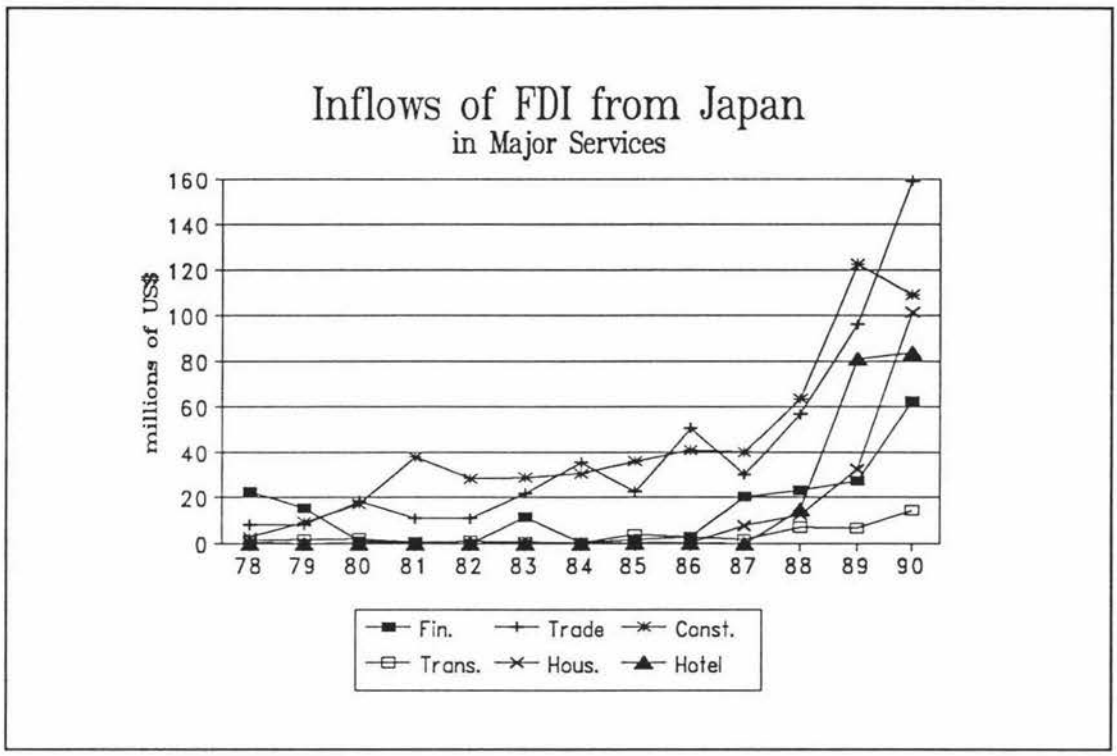
adjusted R^2 = .925, F-statistics = 74.99, significance of F = .000

The most important variable, belonging to the location-specific advantages of the eclectic approach, is GDP_I which is involved in every industry. Another important variable is URB which effects negatively the investment in food, machinery, and chemical industry (equations 6.11, 6.12, 6.19, 6.20, 6.21, and 6.22). WGAP reflects the ownership-specific advantages in terms of the optimal capital stock adjustments, and partly explains the investment in food, and machinery industry (equations 6.11, 6.12, 6.19, and 6.20). The capital intensive technique is possibly used in the production of these industries by Japanese investment. The investment in electrical appliances and other industries not classified, strongly indicate the contributions to export growth. These industries have a comparative advantage (export-performance ratios greater than 1.0), and they depend on the variables of external factors (equations 6.17, 6.18, 6.27, and 6.28).

Investments in the Service Sector

Direct investment in the service sector share around 58 per cent of the total direct investment from Japan. The patterns of investment are shown in Figure 6.4.

Figure 6.4 : Investment in the Service Sector from Japan



The estimated models of both the real inflows, and the real inflows per capita of the investment depend on GDP_S and URB, with the similar explanatory power. Equations 6.29 and 6.30 represent these models.

$$\text{JAP (service)} = \underset{(1.40)}{212.40} + \underset{(6.91)}{27.80}\ GDP_S - \underset{(-3.06)}{40.85}\ URB \qquad (6.29)$$

adjusted R^2 = .929, F-statistics = 79.83, significance of F = .000

$$\text{JAP}_p \text{ (service)} = \underset{(1.48)}{4.00} + \underset{(6.84)}{0.49}\ GDP_S - \underset{(-3.06)}{0.73}\ URB \qquad (6.30)$$

adjusted R^2 = .927, F-statistics = 77.39, significance of F = .000

In the models of the individual industries, the same independent variables are involved in the models of the real inflows, and the models of the real inflows per capita (equations 6.31 - 6.44).

$$\begin{aligned} JAP\ (\text{financ. inst.}) = {} & 133.35 + 7.14\ GDP_S - 22.63\ URB \\ & (4.70) \quad (6.78) \quad (-5.40) \\ & + 0.68\ XM_{JAP} + 4.65\ WGAP \\ & (3.73) \quad (2.77) \end{aligned} \tag{6.31}$$

adjusted R^2 = .878, F-statistics = 22.60, significance of F = .000

$$\begin{aligned} JAP_p\ (\text{financ. inst.}) = {} & 2.75 + 0.14\ GDP_S - 0.46\ URB \\ & (4.80) \quad (6.53) \quad (-5.39) \\ & + 0.01\ XM_{JAP} + 0.09\ WGAP \\ & (3.82) \quad (2.78) \end{aligned} \tag{6.32}$$

adjusted R^2 = .849, F-statistics = 17.88, significance of F = .000

$$\begin{aligned} JAP\ (\text{trade}) = {} & -59.18 + 4.27\ GDP_S \\ & (-4.97) \quad (9.02) \end{aligned} \tag{6.33}$$

adjusted R^2 = .870, F-statistics = 81.43, significance of F = .000

$$\begin{aligned} JAP_p\ (\text{trade}) = {} & -0.99 + 0.07\ GDP_S \\ & (-4.60) \quad (8.77) \end{aligned} \tag{6.34}$$

adjusted R^2 = .864, F-statistics = 76.98, significance of F = .000

$$\begin{aligned} JAP\ (\text{construct.}) = {} & -38.41 + 3.51\ GDP_S \\ & (-4.04) \quad (9.27) \end{aligned} \tag{6.35}$$

adjusted R^2 = .876, F-statistics = 85.96, significance of F = .000

$$\begin{aligned} JAP_p\ (\text{construct.}) = {} & -0.60 + 0.06\ GDP_S \\ & (-3.33) \quad (8.54) \end{aligned} \tag{6.36}$$

adjusted R^2 = .857, F-statistics = 72.89, significance of F = .000

$$JAP \text{ (trans.\& trav.)} = \underset{(-3.37)}{-5.20} + \underset{(5.99)}{0.37\ GDP_S} \quad (6.37)$$

adjusted R^2 = .744, F-statistics = 35.85, significance of F = .000

$$JAP_p\text{(trans.\& trav.)} = \underset{(-2.96)}{-0.08} + \underset{(5.57)}{0.01\ GDP_S} \quad (6.38)$$

adjusted R^2 = .715, F-statistics = 31.06, significance of F = .000

$$JAP \text{ (housing)} = \underset{(2.17)}{83.04} + \underset{(5.82)}{5.91\ GDP_S} - \underset{(-3.50)}{11.77\ URB} \quad (6.39)$$

adjusted R^2 = .852, F-statistics = 35.65, significance of F = .000

$$JAP_p \text{ (housing)} = \underset{(2.18)}{1.47} + \underset{(5.88)}{0.10\ GDP_S} - \underset{(-3.53)}{0.21\ URB} \quad (6.40)$$

adjusted R^2 = .855, F-statistics = 36.50, significance of F = .000

$$JAP \text{ (hotel \& rest.)} = \underset{(-5.57)}{-124.06} + \underset{(6.30)}{2.77\ XMGDP} \quad (6.41)$$

adjusted R^2 = .763, F-statistics = 39.65, significance of F = .000

$$JAP_p \text{ (hotel \& rest.)} = \underset{(-5.57)}{-2.23} + \underset{(6.30)}{0.05\ XMGDP} \quad (6.42)$$

adjusted R^2 = .763, F-statistics = 39.73, significance of F = .000

$$JAP \text{ (other)} = \underset{(0.62)}{9.11} + \underset{(5.12)}{1.99\ GDP_S} - \underset{(-2.08)}{2.68\ URB} \quad (6.43)$$

adjusted R^2 = .888, F-statistics = 48.58, significance of F = .000

$$JAP_p \text{ (other)} = \underset{(0.55)}{0.15} + \underset{(4.95)}{0.03\ GDP_S} - \underset{(-1.97)}{0.05\ URB} \quad (6.44)$$

adjusted R^2 = .884, F-statistics = 46.70, significance of F = .000

Within the service sector, the estimated models have values of adjusted R^2 of more than 70 per cent at very high intervals of confidence. GDP_S is entered as the explanation of every individual industry, except the model of the investment in hotels and restaurants. URB is still related in a negative way to investment in this sector. It partly explains the patterns of the investment in financial institutions (equations 6.31 and 6.32), housing (equations 6.39 and 6.40), and other services not classified (equations 6.43 and 6.44). Finally, the importance of the external factors is found in the model of the investment in hotels and restaurants. XMGDP totally determines the investment at 76 per cent of the explanation (equations 6.41 and 6.42).

In short, direct investment from Japan in the primary product sector is prompted by the opportunity to exploit natural resources, as the production of the export goods is likely to be for the investing country itself, i.e. Japan, rather than competing in the world market as a whole. In contrast, the increasing investment in the industrial sector plays a more important role in the contribution to the export growth of Thailand. At the same time, both the investment in the industrial and service sector support the domestic demand of the country through the domestic market.

CHAPTER 7

EMPIRICAL FINDINGS : THE CASE OF THE EC

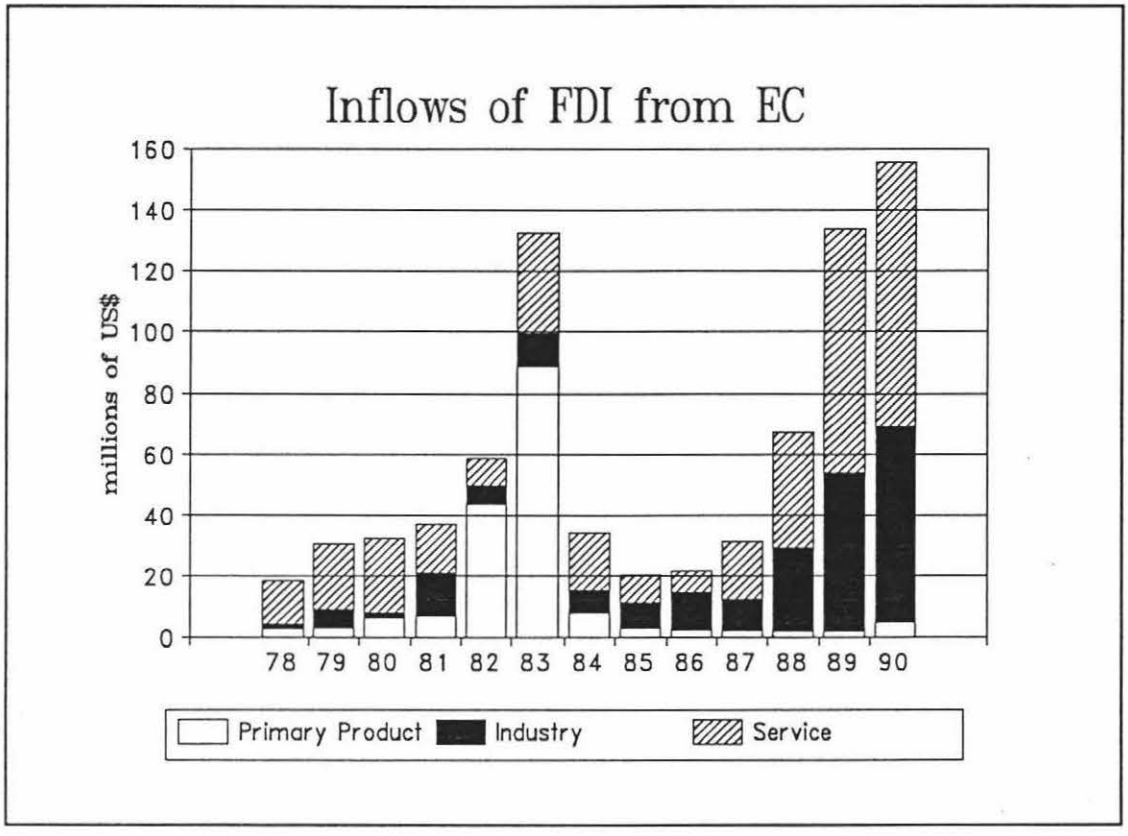
The features of direct investment from EC countries will be reported in this chapter. The overall investment patterns will be discussed in the first section. This will be followed by investment patterns in the three selected sectors. The nature of the investment in individual industries in each sector will be addressed in the final sections.

The Overall Investment

Direct investment from the EC countries is the smallest when compared with the other major investing countries in this study. It shares around 9 per cent of the total direct investment in Thailand. The proportion could be counted at only 7 per cent without the rather large investment in the mining and quarrying industry in 1983 and 1984.

As is the case with the other major investing countries examined in this study, the largest proportion of the investment from EC countries has been in the service sector at around 52 per cent. The investment in the primary product sector and industrial sector share around 20 and 28 per cent respectively. The proportions of the real inflows of the direct investment from EC countries which are invested in the particular sectors are shown in Figure 7.1.

Figure 7.1 : Direct Investment from EC by Sector



The estimated equations of the real inflows, represented by EEC, and the real inflows per capita, represented by EEC_p, are shown in equations 7.1 and 7.2.

$$\begin{aligned} EEC = {} & 468.38 + 10.42\ GDP - 32.56\ URB \\ & (3.45) \quad (4.56) \quad (-3.86) \\ & - 5.71\ XMGDP \\ & (-2.65) \end{aligned} \tag{7.1}$$

adjusted R^2 = .787, F-statistics = 15.75, significance of F = .001

$$\begin{aligned} EEC_p = {} & 9.52 + 0.20\ GDP - 0.64\ URB \\ & (3.46) \quad (4.31) \quad (-3.75) \\ & - 0.11\ XMGDP \\ & (-2.61) \end{aligned} \tag{7.2}$$

adjusted R^2 = .735, F-statistics = 12.08, significance of F = .002

The variables which have a significant impact on the investments from EC countries are GDP, URB, and XMGDP. The variables explain both the model of the real inflows at 79 per cent of explanatory power with significance of F-statistics = .002, and the real inflows per capita of the investment at 73 per cent and .002 respectively. The unexpected negative sign of XMGDP implies that the proportion of exports and imports to GDP does not encourage the investors from EC countries to invest more in Thailand. It is the size of the domestic economic activity (GDP) rather than the economy's external orientation which attract the EC investors.

Tables 7.1 - 7.3 show the details of the real inflows of the investment from EC countries in the particular sectors.

Table 7.1 : The Real Inflows of FDI from EC in the Primary Product Sector : (100 millions of US$)

Year	Agricultural Products	Mining & Quarrying
1978	0.057	2.296
1979	0.000	5.857
1980	0.296	18.618
1981	0.036	22.098
1982	0.000	18.094
1983	0.799	17.635
1984	0.276	92.395
1985	1.733	9.660
1986	1.547	4.378
1987	2.722	7.900
1988	2.294	9.927
1989	1.504	12.198
1990	1.161	16.236

Source : Bank of Thailand

Table 7.2 : The Real Inflows of FDI from EC in the Industrial Sector
: (100 millions of US$)

Year	Food	Text.	Metal.	Elec.ap.	Mach.	Chem.	Petro.	Cons.eq.	Other
1978	0.805	0.023	0.011	8.682	0.000	1.605	4.695	0.017	0.097
1979	0.697	0.000	0.016	4.756	0.037	0.356	6.676	0.543	0.000
1980	1.740	0.848	0.339	9.816	0.189	0.097	0.024	0.000	2.157
1981	0.577	0.092	0.000	21.368	0.124	0.128	41.647	0.000	1.407
1982	1.996	0.000	1.367	19.666	0.572	0.246	0.000	0.000	0.023
1983	3.966	0.066	0.158	10.001	0.093	0.541	0.000	0.000	0.768
1984	0.971	0.064	0.310	10.442	1.497	0.512	0.000	0.000	0.907
1985	5.540	0.131	0.000	6.147	0.920	11.201	0.000	0.000	2.752
1986	7.383	0.058	0.390	5.937	0.184	8.135	0.000	0.000	3.232
1987	3.730	12.955	1.130	4.360	0.126	6.621	0.046	0.313	4.605
1988	8.179	1.945	1.490	12.023	1.263	3.367	0.004	0.789	13.847
1989	14.458	1.542	3.072	46.473	1.152	20.580	0.273	0.232	18.323
1990	4.279	1.392	3.762	32.224	2.660	37.043	0.000	0.250	14.629

Source : Bank of Thailand

Table 7.3 : The Real Inflows of FDI from EC in the Service Sector
: (100 millions of US$)

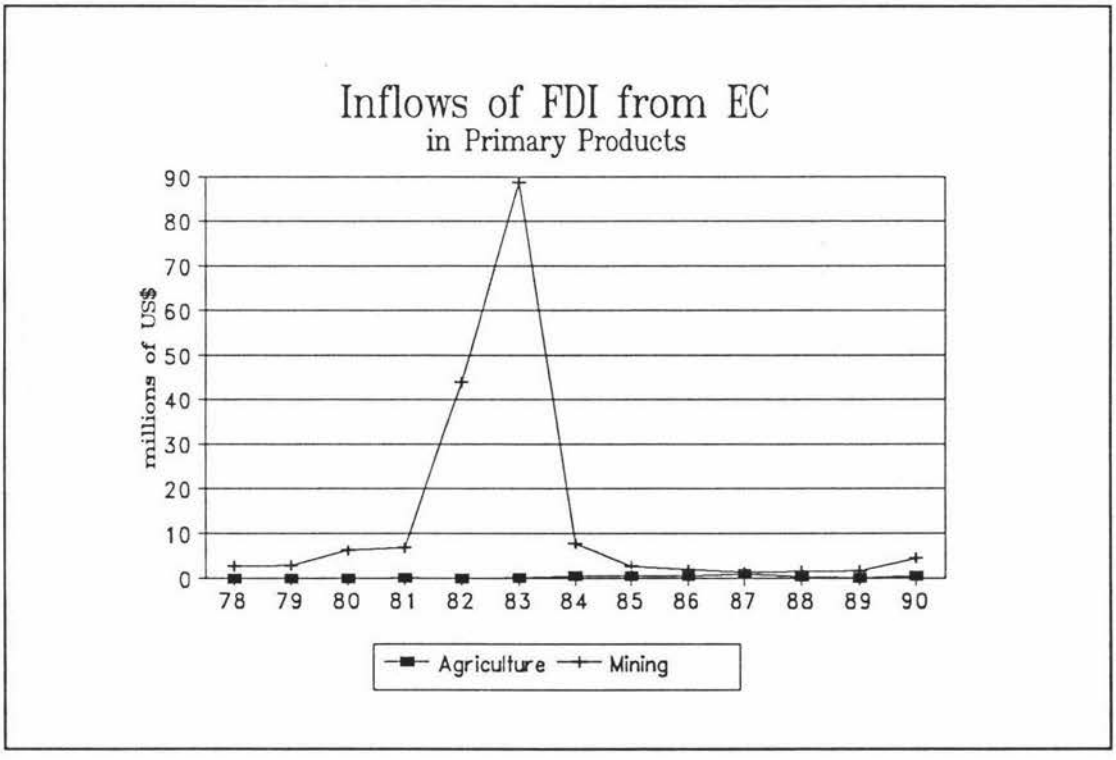
Year	Fin.ins.	Trade.	Const.	Trans.	Hous.	Hotel.	Other
1978	31.039	5.935	0.982	1.834	0.000	0.023	0.308
1979	12.735	2.670	0.691	0.878	0.000	0.064	1.755
1980	3.034	4.169	8.866	1.449	0.291	0.257	9.249
1981	2.793	2.340	8.761	3.715	0.060	1.090	8.055
1982	0.719	4.741	3.196	3.204	0.049	0.367	1.939
1983	1.490	11.885	3.861	2.973	0.042	0.093	1.896
1984	1.581	12.344	1.325	1.045	2.886	0.843	1.463
1985	26.145	13.516	2.642	4.674	8.690	5.899	3.104
1986	1.338	17.441	4.281	5.441	0.213	0.040	4.693
1987	1.901	21.836	5.162	1.775	0.118	0.408	7.449
1988	5.631	33.265	1.513	2.946	5.991	1.752	17.264
1989	13.358	36.535	2.889	5.369	8.004	5.785	11.689
1990	28.950	51.146	0.384	4.087	5.232	3.333	4.978

Source : Bank of Thailand

The Investment in the Primary Product Sector

The annual average investment in the primary product sector is around 10 per cent of the total direct investment from EC countries. Yet, like USA in 1982 and 1983, a sudden surge in investment in the mining and quarrying industry had taken place, mainly for oil exploration, and mainly by the Netherlands. This disproportionate investment surge made the annual average ratios to increase to 74 and 67 per cent in those years. In general, the investment in the mining and quarrying industry shares more than 90 per cent of the investment in the primary product sector. Figure 7.2 shows inflows of the investment in the primary product sector.

Figure 7.2 : Investment in the Primary Product Sector from EC



Once again, in order to avoid the impact of the one-off increase in investment in 1982 and 1983, arithmetic means of the investment over the years for both the primary product sector and in the mining and quarrying industry will be used instead of the actual invesments in those years.

Equation 7.3 represents the estimated equation of the real inflows of the investment in the primary product sector. Equation 7.4 represents the equation of the real inflows per capita.

$$\text{EEC (prim. prodt.)} = \underset{(-1.84)}{-178.49} + \underset{(1.92)}{803.00}\ \text{INF} \qquad (7.3)$$

adjusted R^2 = .183, F-statistics = 3.68, significance of F = .081

$$\text{EEC}_p \text{ (prim. prodt.)} = \underset{(-1.90)}{-3.76} + \underset{(1.98)}{16.89}\ \text{INF} \qquad (7.4)$$

adjusted R^2 = .195, F-statistics = 3.91, significance of F = .074

The values of adjusted R^2, and the interval of confidence of the models are relatively low. The investment in the primary product sector could be explained only by infrastructure (INF) at less than 20 per cent of explanation.

When taking the individual industries, higher levels of explanation and confidence are found in the models of investment in agricultural products, which are explained by the ratio of exports to imports of the home countries, at 47 and 48 per cent of explanatory power with a significance of F-statistics at .006 and .005. In the mining and quarrying industry, however, the very low values of adjusted R^2 and F-statistics still remain in the explanation of INF on the investment. The models are expressed in equations 7.5 - 7.8.

$$\text{EEC (agri. prodt.)} = \underset{(-3.30)}{-6.21} + \underset{(3.43)}{0.07}\ XM_{EEC} \qquad (7.5)$$

adjusted R^2 = .472, F-statistics = 11.74, significance of F = .006

$$\text{EEC}_p \text{ (agri. prodt.)} = \underset{(-3.32)}{-0.12} + \underset{(3.45)}{0.001}\ XM_{EEC} \qquad (7.6)$$

adjusted R^2 = .476, F-statistics = 11.90, significance of F = .005

$$EEC \text{ (mining)} = \underset{(-1.87)}{-181.94} + \underset{(1.94)}{816.81}\ INF \qquad (7.7)$$

adjusted R^2 = .188, F-statistics = 3.78, significance of F = .078

$$EEC_p \text{ (mining)} = \underset{(-1.92)}{-3.82} + \underset{(2.00)}{17.15}\ INF \qquad (7.8)$$

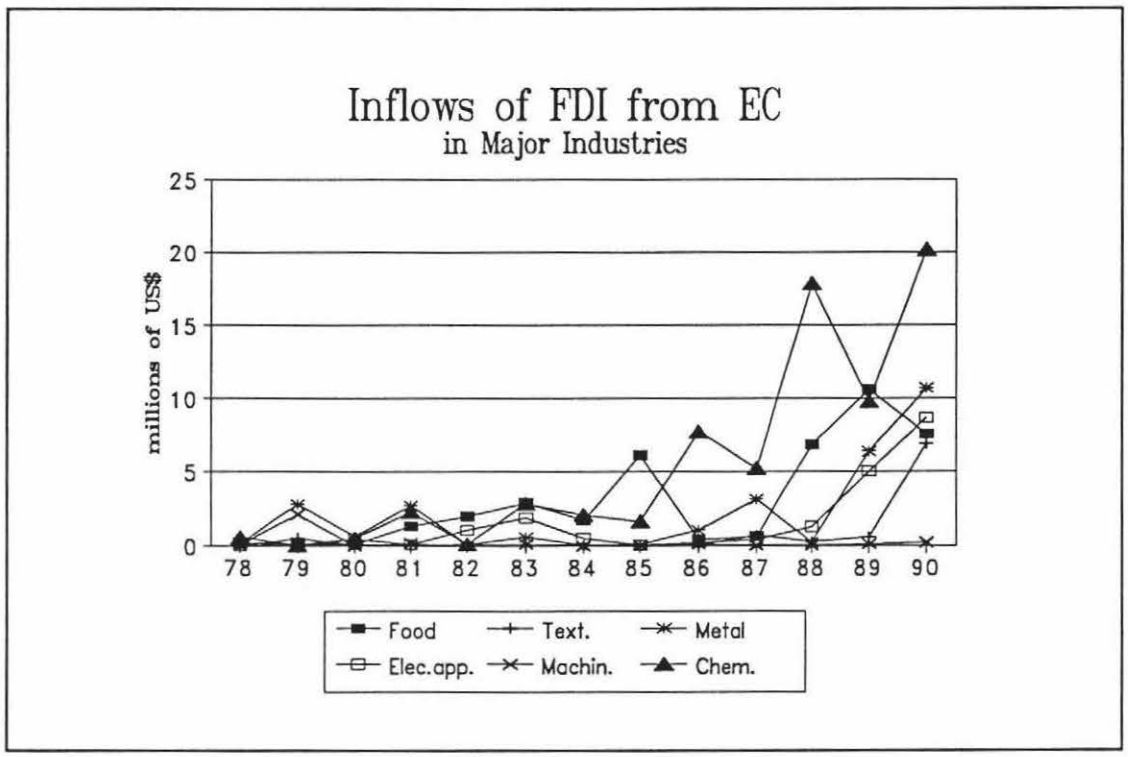
adjusted R^2 = .199, F-statistics = 3.99, significance of F = .071

In the primary product sector, the patterns of the investment could not be explained significantly by the given variables. The models of the investment in agricultural products are explained by the variable of the home countries, XM_{EEC}, at less than 48 per cent of explanation (equations 7.5 and 7.6). While the models of investment in the mining and quarrying industry are explained by INF at a very low explanatory power of less than 20 per cent (equations 7.7 and 7.8).

Investment in the Industrial Sector

Figure 7.3 shows the amounts of the real inflows of investment in the major individual industries in the industrial sector. The investment in the industrial sector shares around 28 per cent of the total direct investment from EC countries annually.

Figure 7.3 : Investment in the Industrial Sector from EC



Differences between the model of the real inflows, and the real inflows per capita are found. The model of the real inflows of the investment in the industrial sector is partly explained by, besides GDP_I and URB, the effect of the capital intensive technique of production (positive WGAP). On the other hand, the model of the real inflows per capita is explained by GDP_I and URB. The estimated models of the investment are shown in equations 7.9 and 7.10.

$$\begin{aligned} EEC \text{ (industrial)} = \; & 50.92 + 6.64\ GDP_I - 6.71\ URB \\ & (3.01) \quad (8.53) \quad (-4.30) \\ & + 1.15\ WGAP \\ & (2.09) \end{aligned} \tag{7.9}$$

adjusted R^2 = .953, F-statistics = 82.36, significance of F = .000

$$\begin{aligned} EEC_p \text{ (industrial)} = \; & 0.72 + 0.10\ GDP_I - 0.09\ URB \\ & (2.08) \quad (6.95) \quad (-3.12) \end{aligned} \tag{7.10}$$

adjusted R^2 = .928, F-statistics = 78.00, significance of F = .000

Although the models of the total investment in this sector are different, there is no distinction, in terms of variables involved in the models, between the models of the real inflows, and the real inflows per capita in every individual industry. The estimated models of the investment in those individual industries are shown in equations 7.11 - 7.28.

$$\begin{array}{lll} EEC\ (food) & = & -2.66 + 0.52\ GDP_I \\ & & (-1.86)\quad (4.46) \end{array} \qquad (7.11)$$

adjusted R^2 = .611, F-statistics = 19.87, significance of F = .001

$$\begin{array}{lll} EEC_p\ (food) & = & -0.04 + 0.01\ GDP_I \\ & & (-1.61)\quad (4.17) \end{array} \qquad (7.12)$$

adjusted R^2 = .577, F-statistics = 17.39, significance of F = .002

$$\begin{array}{lll} EEC\ (textile) & = & 10.68 + 0.71\ GDP_I - 0.94\ URB \\ & & (2.55)\quad (4.16)\qquad (-2.91) \\ & & -0.02\ NAT \\ & & (-2.20) \end{array} \qquad (7.13)$$

adjusted R^2 = .698, F-statistics = 10.27, significance of F = .003

$$\begin{array}{lll} EEC_p\ (textile) & = & 0.19 + 0.01\ GDP_I - 0.02\ URB \\ & & (2.61)\quad (4.21)\qquad (-2.97) \\ & & -0.0004\ NAT \\ & & (-2.25) \end{array} \qquad (7.14)$$

adjusted R^2 = .702, F-statistics = 10.42, significance of F = .003

$$\begin{array}{lll} EEC\ (metal\ base) & = & 13.63 + 1.15\ GDP_I - 1.36\ URB \\ & & (2.26)\quad (4.41)\qquad (-2.79) \end{array} \qquad (7.15)$$

adjusted R^2 = .741, F-statistics = 18.18, significance of F = .000

$$\begin{array}{lll} EEC_p\ (metal\ base) & = & 0.26 + 0.02\ GDP_I - 0.03\ URB \\ & & (2.32)\quad (4.24)\qquad (-2.78) \end{array} \qquad (7.16)$$

adjusted R^2 = .711, F-statistics = 15.76, significance of F = .001

$$\begin{aligned} EEC \text{ (elect. app.)} = \; & 60.11 + 1.67\ GDP_I - 2.33\ URB \\ & (5.18) \quad (8.68) \quad (-7.07) \\ & - 0.18\ XMGDP_I - 108.72\ INF \\ & (-4.67) \quad (-3.28) \end{aligned} \tag{7.17}$$

adjusted R^2 = .955, F-statistics = 64.89, significance of F = .000

$$\begin{aligned} EEC_p \text{ (elect. app.)} = \; & 1.09 + 0.03\ GDP_I - 0.04\ URB \\ & (4.98) \quad (8.27) \quad (-6.77) \\ & - 0.003\ XMGDP_I - 1.98\ INF \\ & (-4.50) \quad (-3.16) \end{aligned} \tag{7.18}$$

adjusted R^2 = .950, F-statistics = 57.59, significance of F = .000

$$EEC \text{ (machinery)}^{82} = 6.96 - 0.07\ XM_{EEC} \quad (1.41) \quad (-1.37) \tag{7.19}$$

adjusted R^2 = .068, F-statistics = 1.88, significance of F = .198

$$EEC_p \text{ (machinery)}^{83} = 0.15 - 0.001\ XM_{EEC} \quad (1.42) \quad (-1.38) \tag{7.20}$$

adjusted R^2 = .070, F-statistics = 1.90, significance of F = .196

$$EEC \text{ (chemical)} = - 7.17 + 1.14\ GDP_I \quad (-3.70) \quad (7.18) \tag{7.21}$$

adjusted R^2 = .808, F-statistics = 51.60, significance of F = .000

$$EEC_p \text{ (chemical)} = - 0.12 + 0.02\ GDP_I \quad (-3.47) \quad (6.94) \tag{7.22}$$

adjusted R^2 = .797, F-statistics = 48.23, significance of F = .000

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[82] The criteria is 80 - 75 per cent of confidence.

[83] The criteria is 80 - 75 per cent of confidence.

$$EEC \text{ (petro. prod.)}^{84} = \underset{(-0.49)}{- 1.50} + \underset{(1.23)}{0.31\ GDP_I} \qquad (7.23)$$

adjusted R^2 = .041, F-statistics = 1.51, significance of F = .245

$$EEC_p \text{ (petro. prod.)}^{85} = \underset{(-0.91)}{- 0.14} + \underset{(1.17)}{0.003\ XMGDP_I} \qquad (7.24)$$

adjusted R^2 = .029, F-statistics = 1.36, significance of F = .268

$$EEC \text{ (const. eqp.)}^{86} = \underset{(-1.37)}{- 0.03} + \underset{(1.41)}{0.0003\ XM_{EEC}} \qquad (7.25)$$

adjusted R^2 = .076, F-statistics = 1.98, significance of F = .187

$$EEC_p \text{ (const. eqp.)}^{87} = \underset{(-1.37)}{- 0.001} + \underset{(1.41)}{0.00001\ XM_{EEC}} \qquad (7.26)$$

adjusted R^2 = .076, F-statistics = 1.98, significance of F = .187

$$EEC \text{ (other)} = \underset{(-2.17)}{- 6.73} + \underset{(5.11)}{0.43\ GDP_I} \underset{(-2.93)}{- 0.05\ NAT} + \underset{(2.24)}{3.80\ RCA} \qquad (7.27)$$

adjusted R^2 = .714, F-statistics = 11.01, significance of F = .002

$$EEC_p \text{ (other)} = \underset{(-1.95)}{- 0.11} + \underset{(4.73)}{0.01\ GDP_I} \underset{(-2.88)}{- 0.001\ NAT} + \underset{(2.13)}{0.07\ RCA} \qquad (7.28)$$

adjusted R^2 = .685, F-statistics = 9.69, significance of F = .003

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[84] The criteria is 75 - 70 per cent of confidence.

[85] The criteria is 70 - 65 per cent of confidence.

[86] The criteria is 80 - 75 per cent of confidence.

[87] The criteria is 80 - 75 per cent of confidence.

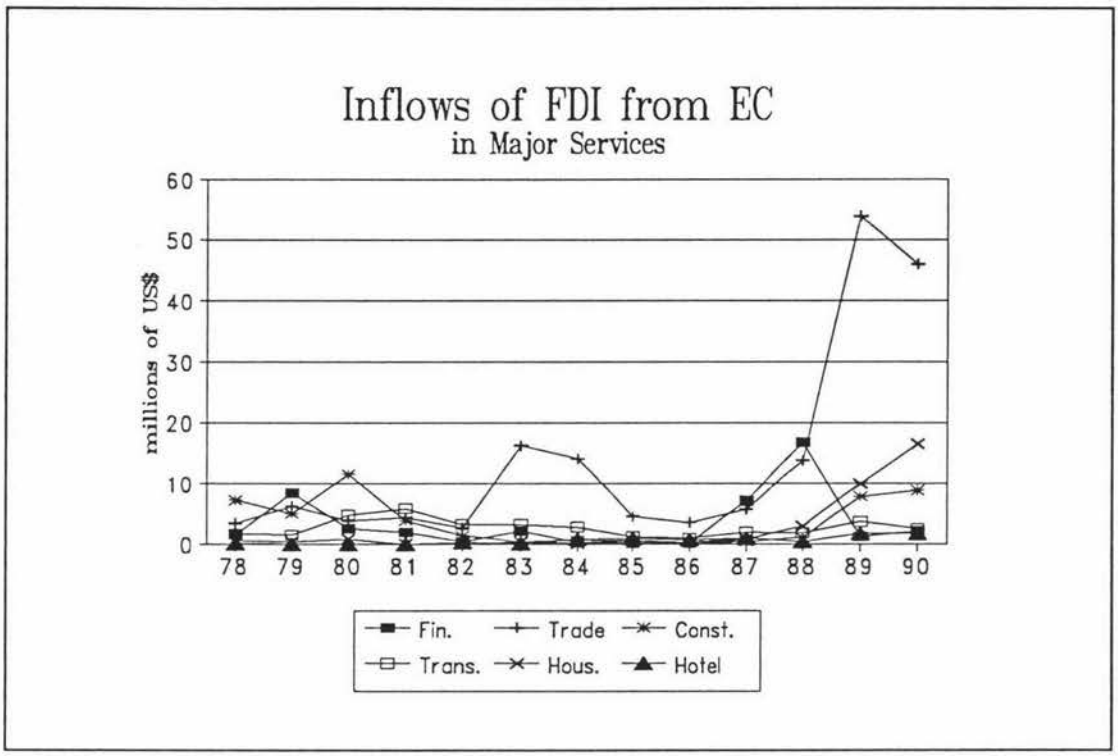
In the models of the investment in textiles (equations 7.13 and 7.14), and other industries not classified (equations 7.27 and 7.28), the change in the percentage of the exports of primary product goods (NAT) affects investment negatively. It is possible that the production of textiles, and other industries invested by the EC investors, employ comparatively more primary raw materials. Eventually in the individual industries, the effect of capital intensive technique is not involved in any of the models so far.

In brief, direct investment in the industrial sector from EC countries does not clearly show its contribution to the export growth of Thailand. Conversely, a negative relation between openness and investment is found in the models of investment in electrical appliances (equations 7.17 and 7.18).

The Investment in the Service Sector

Like other home countries, the largest proportion of the direct investment from EC countries goes to the service sector at an average rate of 52 per cent annually. The patterns of investment in the major individual industries within this sector are shown in Figure 7.4.

Figure 7.4 : Investment in the Service Sector from EC



The results of the multiple regression models strongly support that the investment from EC countries in the service sector depends on the external factor XMGDP. The model of the real inflows of investment (equation 7.29) is explained at 79 per cent of the explanatory power, while 75 per cent of explanatory power is observed in the model of the real inflows per capita of the investment (equation 7.30).

$$\text{EEC (service)} = \underset{(-4.95)}{-88.12} + \underset{(6.71)}{2.35}\ \text{XMGDP} \qquad (7.29)$$

adjusted R^2 = .786, F-statistics = 45.02, significance of F = .000

$$\text{EEC}_p \text{ (service)} = \underset{(-4.36)}{-1.46} + \underset{(6.13)}{0.04}\ \text{XMGDP} \qquad (7.30)$$

adjusted R^2 = .753, F-statistics = 37.59, significance of F = .000

Equations 7.31 - 7.44 express the estimated models of investment in individual industries

within the service sector.

$$EEC\ (financ.\ inst.)^{88} = \underset{(0.33)}{0.85} + \underset{(1.17)}{0.06\ NAT} \qquad (7.31)$$

adjusted R^2 = .029, F-statistics = 1.36, significance of F = .268

$$EEC_p\ (financ.\ inst.)^{89} = \underset{(0.41)}{0.02} + \underset{(1.13)}{0.001\ NA} \qquad (7.32)$$

adjusted R^2 = .022, F-statistics = 1.27, significance of F = .284

$$EEC\ (trade) = \underset{(-2.83)}{-\ 20.75} + \underset{(5.04)}{1.47\ GDP_S} \qquad (7.33)$$

adjusted R^2 = .671, F-statistics = 25.44, significance of F = .000

$$EEC_p\ (trade) = \underset{(-2.53)}{-\ 0.34} + \underset{(4.76)}{0.03\ GDP_S} \qquad (7.34)$$

adjusted R^2 = .643, F-statistics = 22.64, significance of F = .001

$$EEC\ (construct.) = \underset{(2.98)}{72.05} - \underset{(-3.23)}{0.81\ XM_{EEC}} + \underset{(2.48)}{0.20\ XMGD} \qquad (7.35)$$

adjusted R^2 = .520, F-statistics = 7.49, significance of F = .010

$$EEC_p\ (construct.) = \underset{(3.09)}{1.59} - \underset{(-3.25)}{0.02\ XM_{EEC}} + \underset{(1.91)}{0.003\ XMGDP} \qquad (7.36)$$

adjusted R^2 = .478, F-statistics = 6.50, significance of F = .016

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[88] The criteria is 70 - 65 per cent of confidence.

[89] The criteria is 70 - 65 per cent of confidence.

$$EEC\ (\text{trans.\& trav.}) = \underset{(4.61)}{6.06} \underset{(-2.63)}{- 0.30\ WGAP} \quad (7.37)$$

adjusted R^2 = .329, F-statistics = 6.90, significance of F = .024

$$EEC_p\ (\text{trans.\& trav.}) = \underset{(4.90)}{0.13} \underset{(-2.96)}{- 0.01\ WGAP} \quad (7.38)$$

adjusted R^2 = .392, F-statistics = 8.74, significance of F = .013

$$EEC\ (\text{housing}) = \underset{(4.59)}{18.22} \underset{(10.71)}{+ 1.22\ GDP_S} \underset{(-6.86)}{- 2.76\ URB} \underset{(3.36)}{+ 0.44\ WGAP} \quad (7.39)$$

adjusted R^2 = .954, F-statistics = 84.86, significance of F = .000

$$EEC_p\ (\text{housing}) = \underset{(4.59)}{0.33} \underset{(10.61)}{+ 0.02\ GDP_S} \underset{(-6.81)}{- 0.05\ URB} \underset{(3.32)}{+ 0.01\ WGAP} \quad (7.40)$$

adjusted R^2 = .953, F-statistics = 82.84, significance of F = .000

$$EEC\ (\text{hotel \& rest.}) = \underset{(-4.56)}{- 2.74} \underset{(5.55)}{+ 0.18\ URB} \quad (7.41)$$

adjusted R^2 = .713, F-statistics = 30.77, significance of F = .000

$$EEC_p\ (\text{hotel \& rest.}) = \underset{(-5.27)}{- 0.05} \underset{(4.64)}{+ 0.003\ URB} \underset{(2.01)}{+ 0.001\ WGAP} \quad (7.42)$$

adjusted R^2 = .766, F-statistics = 20.63, significance of F = .000

$$EEC\ (\text{other}) = \underset{(-0.67)}{- 1.57} \underset{(1.85)}{+ 0.17\ GDP_S} \quad (7.43)$$

adjusted R^2 = .169, F-statistics = 3.44, significance of F = .091

$$EEC_p \text{ (other)}^{90} = \underset{(-0.48)}{- 0.02} + \underset{(1.61)}{0.003\ GDP_s} \qquad (7.44)$$

adjusted R^2 = .117, F-statistics = 2.59, significance of F = .136

Unlike the industrial sector as a whole, investment in individual industries are positively correlated with both the openness of the country, and the WGAP. Equations 7.35 and 7.36 show the correlations between investment in construction and the openness. Equations 7.39 and 7.40 show the relations between the investment in housing, and the capital intensive technique of production, as well as in the model of the real inflows per capita of the investment in hotels and restaurants (equation 7.42). Nevertheless, the low labour costs of the labour intensive technique can explain the investment in transportation and travel (equations 7.37 and 7.38). Finally, the unexpected positive relationship between investment in hotels and restaurants, and the degree of urbanisation has been found in this sector (equations 7.41 and 7.42).

Direct investment from EC countries does not clearly show the contributions to export growth in the primary product and industrial sectors. However, the importance of the external market is seen in the service sector. Moreover, both the capital and labour intensive techniques are possibly used in different industries within the service sector.

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[90] The criteria is 85 - 80 per cent of confidence.

CHAPTER 8

EMPIRICAL FINDINGS : THE CASE OF ASIAN NICs

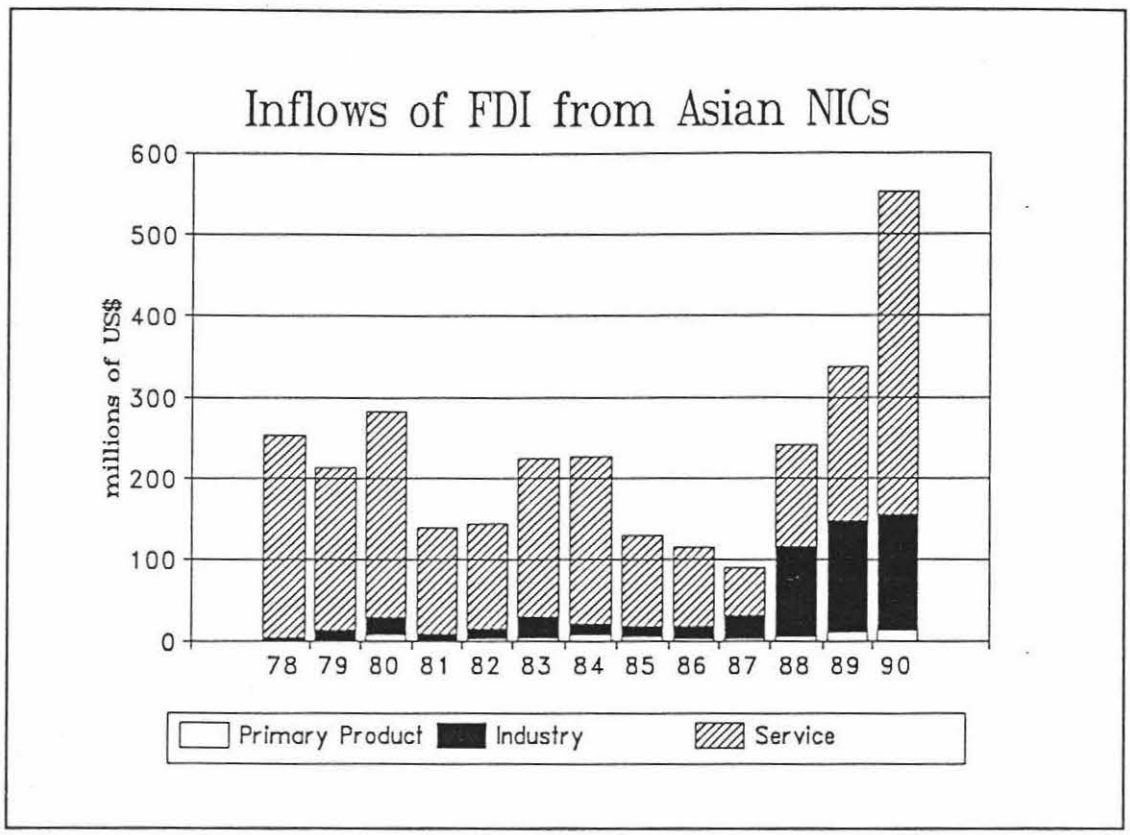
In this chapter, the features of direct investment from Asian newly industrialised countries will be reported. The figures of the overall investment will be illustrated in the first section, and the investment in the specific sectors will be stated separately.

The Patterns of Overall Investment

Direct investment from Asian NIC's are the largest proportion of foreign direct investment in Thailand. Their average share is around 38 per cent of the total foreign direct investment.

Since 1978, a change in the structure of the investment from Asian NIC's can be found. The smallest proportion of their investment, on average 2 per cent, is regularly invested in the primary product sector. Investment in the industrial sector has been around 9 per cent during 1978 to 1986. Yet, the proportion has increased rapidly since 1987 to about 40 per cent of their total investment. On the other hand, the share of investment in the previously dominant service sector decreased from almost 90 per cent over the period, 1978 to 1986, to 61 per cent since 1987. The proportions of the investment in the specific sectors can be seen in Figure 8.1.

Figure 8.1 : Direct Investment from Asian NICs by Sector



The same variables, XMGDP and XM_{NIC}, explain the total real inflows, and real inflows per capita of the investment from Asian NIC countries. The equations are expressed in equations 8.1 and 8.2, where NIC and NIC_p represent the real inflows, and the real inflows per capita of the investments respectively.

$$NIC = \underset{(0.87)}{225.75} + \underset{(4.16)}{11.04}\ XMGDP - \underset{(-1.91)}{6.02}\ XM_{NIC} \qquad (8.1)$$

adjusted R^2 = .561, F-statistics = 8.66, significance of F = .007

$$NIC_p = \underset{(1.61)}{7.87} + \underset{(3.72)}{0.19}\ XMGDP - \underset{(-2.33)}{0.14}\ XM_{NIC} \qquad (8.2)$$

adjusted R^2 = .508, F-statistics = 7.20, significance of F = .011

Total investment depends mainly on external factors. Investments from these Asian countries are clearly linked with the production of exportable goods, even at the level of the specific sectors or individual industries. Therefore, they contributed to the export growth of Thailand.

Tables 8.1 - 8.3 show the inflows of the investment from Asian NIC countries in the particular sectors.

Table 8.1 : The Real Inflows of FDI from Asian NICs in the Primary Product Sector : 100 millions of US$

Year	Agricultural Products	Mining & Quarrying
1978	0.000	0.168
1979	0.098	0.387
1980	2.942	4.920
1981	0.008	1.556
1982	0.497	1.955
1983	0.000	3.805
1984	0.109	8.076
1985	0.119	5.315
1986	0.165	2.875
1987	1.366	1.620
1988	1.322	3.537
1989	6.592	4.263
1990	7.242	6.698

Source : Bank of Thailand

Table 8.2 : The Real Inflows of FDI from Asian NICs in the Industrial Sector : 100 millions of US$

Year	Food	Text.	Metal.	Elec.ap.	Mach.	Chem.	Petro.	Cons.eq.	Other
1978	0.250	0.303	1.052	0.040	0.000	0.836	0.000	0.000	1.135
1979	0.396	0.033	0.428	9.423	0.660	0.503	0.000	0.135	2.046
1980	0.111	0.630	0.048	12.055	0.417	5.928	0.000	0.179	2.458
1981	2.178	0.121	1.373	1.210	2.105	0.846	0.000	0.297	0.166
1982	1.191	3.060	0.157	1.052	5.407	1.249	0.004	0.258	0.624
1983	1.332	2.536	5.042	2.150	10.494	3.867	0.000	0.667	0.693
1984	1.134	1.563	1.593	1.595	4.252	2.711	0.000	0.187	0.696
1985	4.471	1.172	0.194	0.913	0.102	4.419	0.000	1.032	0.809
1986	1.675	0.540	1.035	10.324	0.324	0.365	0.000	0.153	1.899
1987	3.035	4.613	1.572	5.888	0.017	7.670	0.249	0.131	6.148
1988	5.084	14.870	7.922	31.980	1.227	22.598	0.000	0.076	27.641
1989	9.325	12.289	6.707	33.885	3.226	23.138	0.000	1.238	46.212
1990	13.198	21.859	8.681	39.360	2.712	9.242	0.000	0.166	46.281

Source : Bank of Thailand

Table 8.3 : The Real Inflows of FDI from Asian NICs in the Service Sector : 100 millions of US$

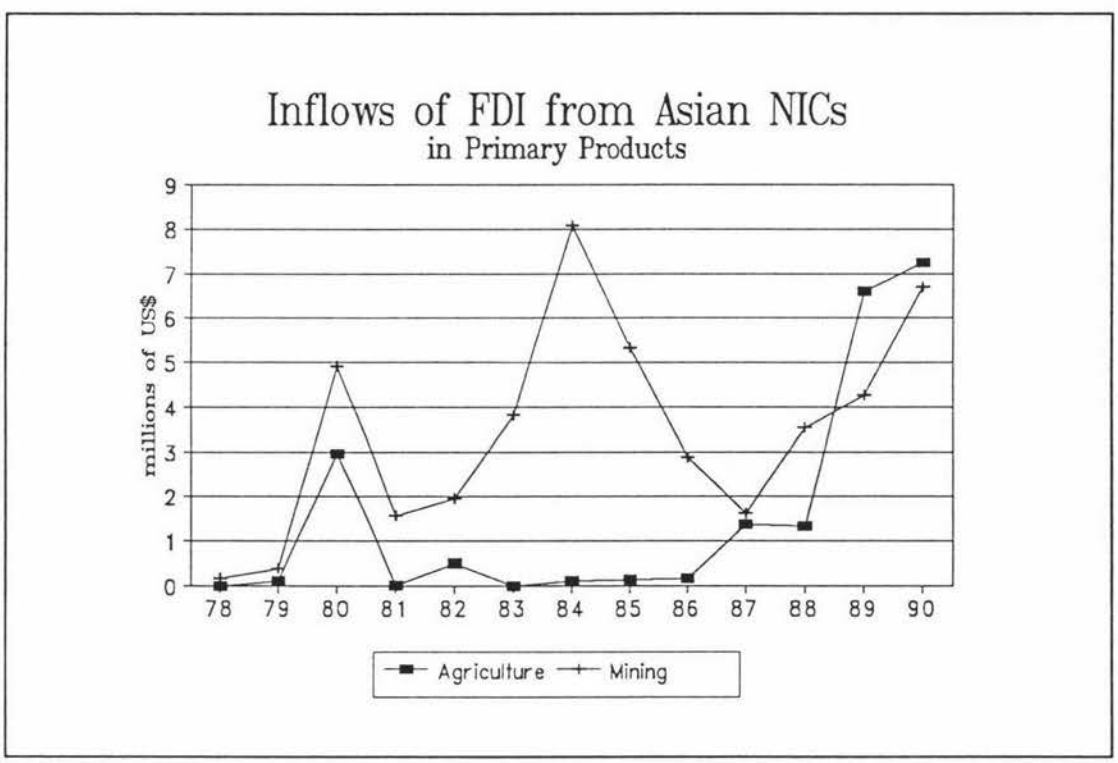
Year	Fin.ins.	Trade.	Const.	Trans.	Hous.	Hotel.	Other
1978	243.26	5.19	0.24	0.78	0.00	0.07	0.03
1979	192.94	4.78	0.08	1.09	0.00	0.07	0.98
1980	219.03	18.03	1.38	1.62	8.27	4.04	1.30
1981	108.24	13.84	3.12	0.89	0.34	2.51	0.57
1982	107.87	13.10	2.90	2.25	0.00	1.75	0.80
1983	169.53	16.36	1.23	0.34	4.24	1.26	1.35
1984	175.69	20.94	6.14	0.74	0.22	0.49	1.49
1985	71.54	15.43	17.65	0.54	2.16	0.75	2.51
1986	73.64	9.62	7.09	1.47	1.03	2.16	1.49
1987	27.04	16.18	7.46	2.21	2.48	0.98	2.92
1988	69.56	31.46	8.00	2.16	7.06	5.56	2.00
1989	51.98	52.87	11.41	0.90	42.06	23.34	8.45
1990	167.01	126.94	14.94	8.29	55.35	18.06	7.26

Source : Bank of Thailand

The Investment in the Primary Product Sector

Around 2 per cent of total direct investments from the Asian NIC has been invested in the primary product sector since 1978. Around 79 per cent of this share is invested in the mining and quarrying industry. The rest of 21 per cent is invested in agricultural products. Figure 8.2 shows the patterns of the investment in those industries.

Figure 8.2 : Investment in the Primary Product Sector from Asian NICs



The estimated models of the investment in the primary product sector show that investment relates negatively to infrastructure, which is measured by the ratio of commerce, transport, and communication to GDP. This could imply that the other components of the national accounts, consisting of the sectors such as agriculture, mining and quarrying, and manufacturing, determine the investment positively. In other words, the change in investment in the primary product sector depends directly on the growth of the primary product, and manufacturing production. The models of the investment in the primary product sector are shown in equations 8.3 and 8.4.

$$NIC \text{ (prim. prodt.)} = \underset{(4.68)}{114.46} \underset{(-4.48)}{- 473.16\ INF} \quad (8.3)$$

adjusted R^2 = .614, F-statistics = 20.06, significance of F = .001

$$NIC_p \text{ (prim. prodt.)} = \underset{(4.64)}{2.09} \underset{(-4.43)}{- 8.63\ INF} \quad (8.4)$$

adjusted R^2 = .608, F-statistics = 19.63, significance of F = .001

In individual industries, INF is involved in both industries. Especially in the mining and quarrying industry, INF is the only variable that has a significant correlation with the investment. In agricultural products, however, other explanatory variables, GDP_P and $XMGDP_P$, both explain the models together with INF. The models of the investment in these industries are shown in equations 8.5 - 8.8.

$$NIC \text{ (agri. prodt.)} = \underset{(1.39)}{22.44} + \underset{(1.86)}{0.46\ GDP_P} + \underset{(2.67)}{0.29\ XMGDP_P} \underset{(-2.17)}{- 142.29\ INF} \quad (8.5)$$

adjusted R^2 = .806, F-statistics = 17.59, significance of F = .000

$$NIC_p \text{ (agri. prodt.)} = \underset{(1.58)}{0.47} + \underset{(1.60)}{0.01\ GDP_P} + \underset{(2.81)}{0.01\ XMGDP_P} \underset{(-2.36)}{- 2.83\ INF} \quad (8.6)$$

adjusted R^2 = .803, F-statistics = 17.28, significance of F = .000

$$NIC \text{ (mining)} = \underset{(2.92)}{53.43} \underset{(-2.73)}{- 216.05\ INF} \quad (8.7)$$

adjusted R^2 = .349, F-statistics = 7.45, significance of F = .020

$$NIC_p \text{ (mining)} = \underset{(2.69)}{0.98} \underset{(-2.50)}{- 3.93\ INF} \quad (8.8)$$

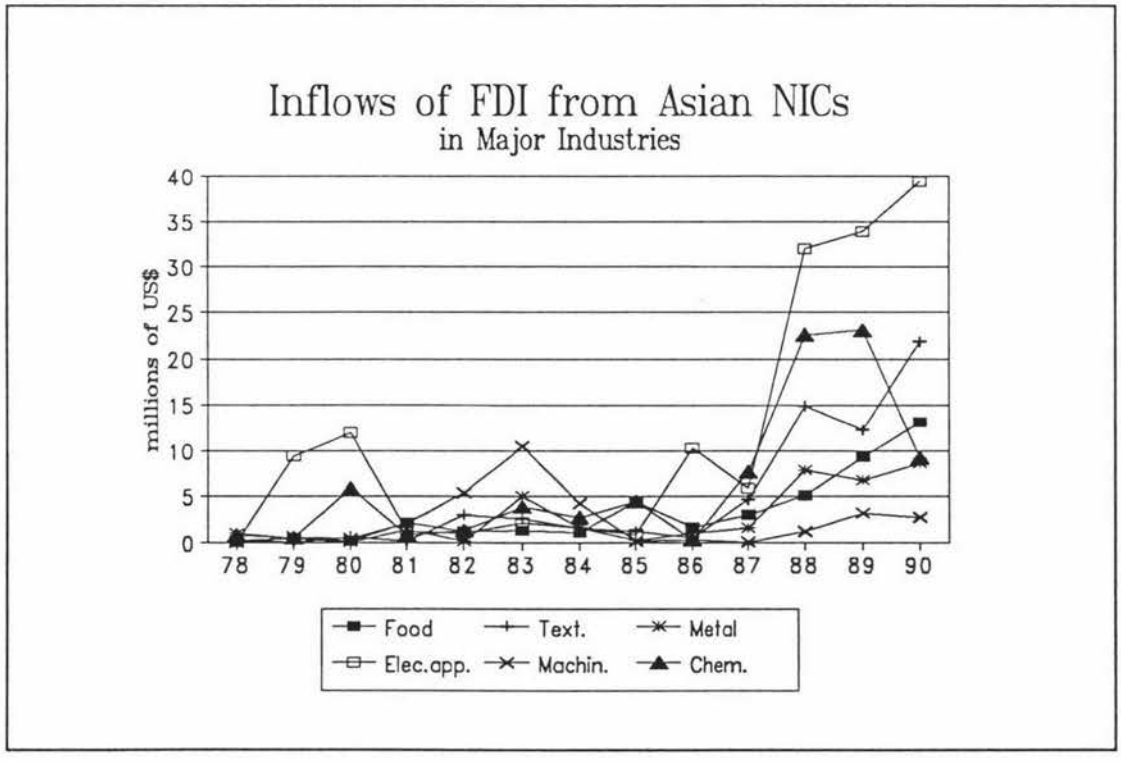
adjusted R^2 = .305, F-statistics = 6.26, significance of F = .029

Briefly, the models of the investment in the primary product sector from Asian NIC's in both the mining and quarrying industry, and agricultural products depend on the growth of the agricultural and manufacturing production. Also, in agricultural products where the RCA is greater than 1.0, the importance of the external market is found.

Investment in the Industrial Sector

As mentioned above, the share of the investment in the industrial sector from the Asian countries has increased very rapidly from 9 percent in the period to 1985, to 36 per cent in the second half of the last decade. The patterns of the investment in the major individual industries within the industrial sector can be seen in Figure 8.3.

Figure 8.3 : Investment in the Industrial Sector from Asian NICs



It can be clearly seen that, besides GDP_I, (GDP in the industrial sector), the Asian NIC countries' investment in the industrial sector is related closely to the external market, as shown in equations 8.9 and 8.10.

$$\begin{array}{lll} \text{NIC (industrial)} = & -125.39 + 7.43\ GDP_I + 1.45\ XMGDP_I & (8.9) \\ & (-5.25)\quad (8.65)\quad\ (3.13) & \end{array}$$

adjusted R^2 = .928, F-statistics = 78.46, significance of F = .000

$$\begin{array}{lll} NIC_p\ \text{(industrial)} = & -2.25 + 0.13\ GDP_I + 0.03\ XMGDP_I & (8.10) \\ & (-5.09)\quad (8.19)\quad\ (3.17) & \end{array}$$

adjusted R^2 = .922, F-statistics = 72.37, significance of F = .000

Furthermore, the external factors significantly attract investment in a number of individual industries, too. The estimated models of the investment in individual industries are shown in equations 8.11 - 8.28.

$$\begin{array}{lll} \text{NIC (food)} = & 6.53 + 0.88\ GDP_I - 0.19\ XM_{NIC} & \\ & (1.65)\quad (10.79)\quad\ (-3.23) & \\ & + 0.15\ WGAP & (8.11) \\ & \quad (2.31) & \end{array}$$

adjusted R^2 = .932, F-statistics = 55.66, significance of F = .000

$$\begin{array}{lll} NIC_p\ \text{(food)} = & -0.07 + 0.01\ GDP_I & (8.12) \\ & (-4.38)\quad (8.99) & \end{array}$$

adjusted R^2 = .869, F-statistics = 80.83, significance of F = .000

$$\begin{array}{lll} \text{NIC (textile)} = & 9.55 + 1.97\ GDP_I - 1.49\ URB & (8.13) \\ & (1.23)\quad (5.87)\quad\ (-2.38) & \end{array}$$

adjusted R^2 = .911, F-statistics = 62.50, significance of F = .000

$$\begin{array}{lll} NIC_p\ \text{(textile)} = & 0.17 + 0.03\ GDP_I - 0.03\ URB & (8.14) \\ & (1.16)\quad (5.62)\quad\ (-2.24) & \end{array}$$

adjusted R^2 = .905, F-statistics = 58.16, significance of F = .000

$$\text{NIC (metal base)} = \underset{(-2.52)}{-2.81} + \underset{(5.51)}{0.50\ GDP_I} \qquad (8.15)$$

adjusted R^2 = .710, F-statistics = 30.32, significance of F = .000

$$\text{NIC}_p \text{ (metal base)} = \underset{(-2.13)}{-0.05} + \underset{(4.99)}{0.01\ GDP_I} \qquad (8.16)$$

adjusted R^2 = .665, F-statistics = 24.86, significance of F = .000

$$\text{NIC (elect. app.)} = \underset{(-4.77)}{-40.76} + \underset{(5.79)}{1.78\ GDP_I} + \underset{(3.35)}{0.55\ XMGDP_I} \qquad (8.17)$$

adjusted R^2 = .880, F-statistics = 45.18, significance of F = .000

$$\text{NIC}_p \text{ (elect. app.)} = \underset{(-4.56)}{-0.75} + \underset{(5.04)}{0.03\ GDP_I} + \underset{(3.38)}{0.01\ XMGDP_I} \qquad (8.18)$$

adjusted R^2 = .860, F-statistics = 37.95, significance of F = .000

$$\text{NIC (machinery)}^{91} = \underset{(-0.90)}{-11.66} \underset{(-1.90)}{-0.30\ XM_{NIC}} + \underset{(3.12)}{2.93\ URB} \underset{(-2.76)}{-46.91\ RCA} \qquad (8.19)$$

adjusted R^2 = .383, F-statistics = 3.48, significance of F = .064

$$\text{NIC}_p \text{ (machinery)}^{92} = \underset{(-0.91)}{-0.24} \underset{(-1.85)}{-0.01\ XM_{NIC}} + \underset{(3.09)}{0.06\ URB} \underset{(-2.80)}{-0.95\ RCA} \qquad (8.20)$$

adjusted R^2 = .384, F-statistics = 3.50, significance of F = .063

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[91] The criteria is 45 - 40 per cent of confidence.

[92] The criteria is 50 - 45 per cent of confidence.

$$\text{NIC (chemical)} = \underset{(-3.38)}{-12.08} + \underset{(4.95)}{1.13\ GDP_I} + \underset{(2.98)}{0.13\ NAT} \qquad (8.21)$$

adjusted R^2 = .706, F-statistics = 15.40, significance of F = .001

$$\text{NIC}_p \text{ (chemical)} = \underset{(-3.30)}{-0.21} + \underset{(4.83)}{0.02\ GDP_I} + \underset{(3.09)}{0.002\ NAT} \qquad (8.22)$$

adjusted R^2 = .702, F-statistics = 15.12, significance of F = .001

$$\text{NIC (petro. prod.)}^{93} = \underset{(-1.32)}{-0.28} + \underset{(1.42)}{0.003\ XM_{NIC}} \qquad (8.23)$$

adjusted R^2 = .078, F-statistics = 2.02, significance of F = .183

$$\text{NIC}_p \text{ (petro. prod.)}^{94} = \underset{(-1.32)}{-0.005} + \underset{(1.42)}{0.0001\ XM_{NIC}} \qquad (8.24)$$

adjusted R^2 = .077, F-statistics = 2.00, significance of F = .185

$$\text{NIC (const. eqp.)}^{95} = \underset{(1.41)}{5.05} - \underset{(-1.32)}{20.32\ INF} \qquad (8.25)$$

adjusted R^2 = .058, F-statistics = 1.73, significance of F = .215

$$\text{NIC}_p \text{ (const. eqp.)}^{96} = \underset{(1.33)}{0.09} - \underset{(-1.23)}{0.36\ INF} \qquad (8.26)$$

adjusted R^2 = .041, F-statistics = 1.51, significance of F = .244

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[93] The criteria is 80 - 75 per cent of confidence.

[94] The criteria is 80 - 75 per cent of confidence.

[95] The criteria is 75 - 70 per cent of confidence.

[96] The criteria is 75 - 70 per cent of confidence.

$$\text{NIC (other)} = \underset{(-5.15)}{-56.27} + \underset{(11.57)}{3.47\ GDP_I} + \underset{(3.19)}{17.34\ RCA} \qquad (8.27)$$

adjusted R^2 = .920, F-statistics = 70.35, significance of F = .000

$$NIC_p\ \text{(other)} = \underset{(-4.97)}{-1.01} + \underset{(11.18)}{0.06\ GDP_I} + \underset{(3.11)}{0.31\ RCA} \qquad (8.28)$$

adjusted R^2 = .915, F-statistics = 65.56, significance of F = .000

Where individual industries are concerned, the importance of the external market is found in the models of the industries which have comparative advantages, for example electrical appliances, and other industries, not classified (equations 8.17, 8.18, 8.27, and 8.28). By contrast, the models of investment in machinery, where the RCA is lower than 1.0, show the relationship between investment and negative RCA (equations 8.19 and 8.20). Thus, in the production of machinery invested by the Asian NIC countries' investors could not produce to compete efficiently in the world market but rather serve domestic demand. In addition, the capital intensive technique is involved in the models of the real inflows of investment in food industry (equation 8.11).

In general, the direct investment from Asian NIC's in the industrial sector supports the export growth of Thailand, especially in industries which have the RCA greater than 1.0. The investment in electrical appliances, for instance, based strongly on the product life cycle approach, explains the investment of developing countries as a '*Japanese-type, trade-oriented*' foreign direct investment. The industries to be chosen should be those in which Thailand is gaining comparative advantages, while the home countries are losing because of the higher costs. Such industries should preferably be export-oriented, not merely serving the benefit of the economically privileged classes in Thailand[97].

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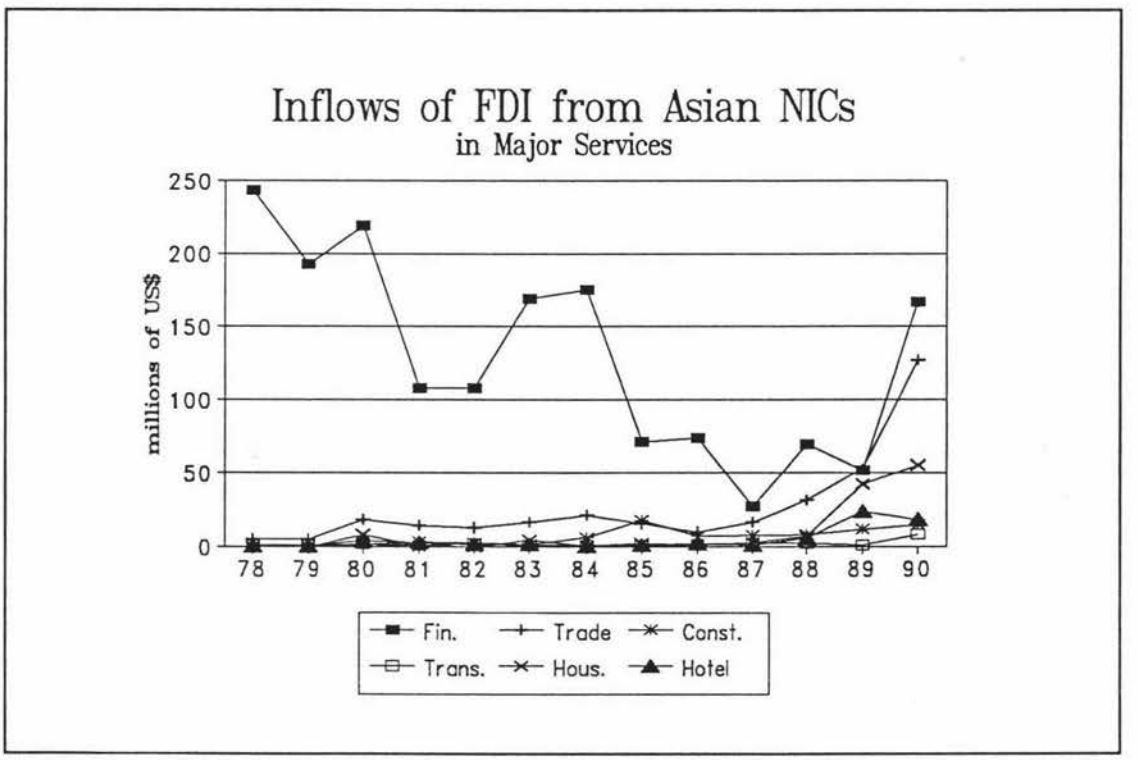
[97] Kojima, 1978, pp. 85-87. And see also J. Iamjitmetta, "*Effects of Foreign Investment in Thailand : A Dynamic Comparison*", Thammasat Economic Journal, Vol. 7(3), 1989.

Investment in the Service Sector

Before 1987 the proportion of investment in the service sector from Asian NIC countries shared around 89 per cent of their direct investment annually. Since 1987 the proportion has decreased to 61 per cent. Nevertheless, it is the largest proportion of investment from Asian NIC countries invested in Thailand. Figure 8.4 shows the patterns of the investment in the service sector by individual industries.

Figure 8.4 : Investment in the Service Sector from Asian NICs



As shown in equations 8.29 and 8.30, the estimated model of the real inflows of investment shows the relationship of negative INF, negative XM_{NIC}, and positive GDP_S to investment. The model of the real inflows per capita shows that the investment depends on negative XM_{NIC}, and negative INF, GDP_s not being a significant determine factor.

$$\text{NIC (service)}^{98} = \underset{(2.77)}{2203.89} \underset{(-1.72)}{- 5432.60\ \text{INF}} \underset{(-3.75)}{- 9.92\ XM_{NIC}} + \underset{(2.12)}{5.80\ GDP_S} \quad (8.29)$$

adjusted R^2 = .580, F-statistics = 6.51, significance of F = .012

$$NIC_p \text{ (service)}^{99} = \underset{(3.58)}{55.35} \underset{(-3.33)}{- 0.16\ XM_{NIC}} \underset{(-2.86)}{- 161.14\ \text{INF}} \quad (8.30)$$

adjusted R^2 = .489, F-statistics = 6.74, significance of F = .014

The same explanatory variables explain the models of the real inflows, and the real inflows per capita of investment in each industry. The estimated models are expressed in equations 8.31 - 8.44.

$$\text{NIC (financ. inst.)} = \underset{(4.46)}{694.79} \underset{(-3.64)}{- 6.21\ XM_{NIC}} \quad (8.31)$$

adjusted R^2 = .506, F-statistics = 13.28, significance of F = .004

$$NIC_p \text{ (financ. inst.)} = \underset{(4.84)}{15.89} \underset{(-4.05)}{- 0.15\ XM_{NIC}} \quad (8.32)$$

adjusted R^2 = .562, F-statistics = 16.41, significance of F = .002

$$\text{NIC (trade)} = \underset{(2.69)}{109.10} + \underset{(9.29)}{4.10\ GDP_S} \underset{(-3.84)}{- 1.96\ XM_{NIC}} \quad (8.33)$$

adjusted R^2 = .885, F-statistics = 47.41, significance of F = .000

$$NIC_p \text{ (trade)} = \underset{(2.85)}{2.06} + \underset{(9.24)}{0.07\ GDP_S} \underset{(-3.94)}{- 0.04\ XM_{NIC}} \quad (8.34)$$

adjusted R^2 = .883, F-statistics = 46.46, significance of F = .000

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[98] the criteria is 85 - 80 per cent of confidence.

[99] The criteria is 85 - 80 per cent of confidence.

$$\text{NIC (construct.)} = \underset{(-4.08)}{-28.36} + \underset{(4.27)}{1.42\ \text{URB}} + \underset{(1.88)}{0.32\ \text{WGAP}} \qquad (8.35)$$

adjusted R^2 = .669, F-statistics = 13.14, significance of F = .002

$$\text{NIC}_p \text{ (construct.)} = \underset{(-3.85)}{-0.51} + \underset{(3.90)}{0.02\ \text{URB}} + \underset{(1.98)}{0.01\ \text{WGAP}} \qquad (8.36)$$

adjusted R^2 = .640, F-statistics = 11.67, significance of F = .002

$$\text{NIC (trans.\& trav.)} = \underset{(1.63)}{7.56} + \underset{(3.20)}{0.39\ \text{GDP}_S} - \underset{(-2.07)}{0.84\ \text{URB}} \qquad (8.37)$$

adjusted R^2 = .583, F-statistics = 9.38, significance of F = .005

$$\text{NIC}_p \text{ (trans.\& trav.)} = \underset{(1.78)}{0.15} + \underset{(3.18)}{0.01\ \text{GDP}_S} - \underset{(-2.15)}{0.02\ \text{URB}} \qquad (8.38)$$

adjusted R^2 = .557, F-statistics = 8.54, significance of F = .007

$$\text{NIC (housing)} = \underset{(-5.24)}{-69.99} + \underset{(6.06)}{1.60\ \text{XMGDP}} \qquad (8.39)$$

adjusted R^2 = .748, F-statistics = 36.68, significance of F = .000

$$\text{NIC}_p \text{ (housing)} = \underset{(-5.22)}{-1.25} + \underset{(6.06)}{0.03\ \text{XMGDP}} \qquad (8.40)$$

adjusted R^2 = .748, F-statistics = 36.69, significance of F = .000

$$\text{NIC (hotel \& rest.)} = \underset{(-5.39)}{-28.49} + \underset{(6.39)}{0.67\ \text{XMGDP}} \qquad (8.41)$$

adjusted R^2 = .769, F-statistics = 40.89, significance of F = .000

$$\text{NIC}_p \text{ (hotel \& rest.)} = \underset{(-5.31)}{-0.51} + \underset{(6.33)}{0.01\ \text{XMGDP}} \qquad (8.42)$$

adjusted R^2 = .765, F-statistics = 40.11, significance of F = .000

$$NIC\ (other) = -3.16 + 0.24\ GDP_S \quad (8.43)$$
$$(-3.37)\quad (6.36)$$

adjusted R^2 = .767, F-statistics = 40.50, significance of F = .000

$$NIC_p\ (other) = -0.05 + 0.004\ GDP_S \quad (8.44)$$
$$(-3.05)\quad (6.09)$$

adjusted R^2 = .750, F-statistics = 37.11, significance of F = .000

The effects of the external factors which could strongly support the contributions to the export growth is found in the models of the investment in housing (equations 8.39 and 8.40), and hotels and restaurants (equations 8.41 and 8.42). Finally, the capital intensive technique partly determines the investment in construction. Also in this industry, a positive relationship between urbanisation, and investment is found (equations 8.35 and 8.36).

In brief, the structure of the direct investment from Asian NIC's not unlike that from Japan, has changed. The industrial sector, since 1987, has been more heavily invested in. The contributions to the export growth of Thailand through the investment are found in every sector, particularly in the individual industries that have comparative advantages, such as agricultural products, electrical appliances, and indirectly in housing and hotels and restaurants.

CHAPTER 9
CONCLUSIONS AND SOME OBSERVATIONS

Conclusions

As in many other developing countries, foreign direct investment has been necessary for Thailand's economic growth because of the inadequacy of her domestic savings. The domestic saving rate is relatively low, and there is a large gap between savings and investment, which is not covered by the imperfectly developed capital market. Since the 1970's, there has been an increasing dependence on foreign direct investment for financing[100] Thailand's economic development and growth.

The findings of the present study are, to a large extent, similar to those of on Suehiro's related to foreign investment in Thailand[101]. The most important incentives for the investors are market factors. The market size, the expectation of the growth of the Thai economy, and the openness of the economy, measured by GDP, XMGDP, and positive URB, as explained in the text determine the investment from every source in every sector. In particular, the external market factors have played an important role in attracting investment from Japan and the Asian NIC's in Thailand's industrial, and service sectors. Secondly, the cost factors -low production costs and natured resource endowments affect investment in the industrial sector and the service sector from every source country. These factors have also influenced investment in the primary product sector from the United States. These factors are represented by WGAP, NAT, and the negative URB in the text. Thirdly, investment incentives, represented by INF in the study, explain the flows of the direct investment to the primary product sector from EC countries. Another variable, included as an investment disincentive-political risk, POR, was found not to be significant. Finally, trade and fiscal barriers, measured by TAX, was found not to be significant as an

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[100] E. B. Ayal, 1992, *"Thailand and the World : The Transformation to Modernity"*, in Brown R. H. and Liu W. T. (ed.), Modernization in East Asia : Political, Economic, and Social Perspectives, pp. 124-126. And see also Lim and Fong, 1991, p. 25.

[101] A. Suehiro, 1985, Capital Accumulation and Industrial Development of Thailand, Chulalongkorn University, chapter 4.

explanatory variable. This is because although Thailand has strong government participation and intervention in the economy,it also has an important and powerful private sector that is not prone to significant policy instability[102].

Identifying the sources of growth of the Thai economy helped to establish how far the product life cycle approach, especially Akamatsu's catching-up approach, was able to explain the patterns of foreign direct investment. During 1978 - 1981, when the Fourth development plan was in force, the importance of the strong import substitution policy led to an increase in domestic production to meet rising domestic demand. Foreign direct investment was encouraged to introduce greater competition in the domestic market. During the Fifth plan period, 1982 - 1986, the degree of import substitution increased in consumer goods while there were huge imports of capital goods. Export growth was increasing while growth in domestic demand declined. Over the period 1987 - 1990, when the export promotion programme was particularly emphasized[103], the degree of import substitution declined rapidly. Although domestic demand increased because of the growth of the economy, export growth played a more important role in economic growth. The increased domestic production, partly created by foreign direct investment, progressed to the export of internationally competitive products. Particularly in the industrial sector, the annual average export growth accelerated remarkably rapidly while both domestic demand and import substitution declined as compared to the first period. Foreign direct investment was more likely to be invested to produce exportable goods, particularly in the industries that had comparative advantage.

The contribution to Thailand's economic growth of foreign direct investment differs as to the different home countries. Firstly, in the case of the United States, the aim of resource exploitation is implicitly found in their choice of the primary product sector. The results tend to confirm that such investments did not help export growth so much as they did domestic demand. Secondly, direct investment from Japan also shows some exploitation of resources in the primary product sector. Their investment in the industrial sector

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[102] Lim and Fong, 1991, p. 19.

[103] Government of Thailand, 1987, The Sixth National Economic and Social Development Plan (1987-1991), pp. 3-19.

directly supports export growth in some comparative-advantage industries. Direct investment from Asian NIC's however has made a contribution to the export growth of Thailand both in agricultural products in the primary product sector, and in industries with a revealed comparative advantage. The features of the direct investment from Asian NIC countries could be explained by the product life cycle approach. When the costs of production reach a competitive level, developing countries' firms which tend to produce unsophisticated, low-technology products produce not only for their existing domestic markets, but also for exporting abroad. Moreover, with labour-intensive, small-scale technology that is appropriate to the factor costs and market size, developing countries' firms tend to repatriate less of their profits, and offer greater benefits to the host countries without at the same time shifting many of the costs associated with the investment[104]

In general, the positive impacts of foreign direct investment in Thailand have been considerable. Most significantly, the increase in the income level of Thailand must be seen in the context of the large inflows of foreign investment. As this study shows, FDI is best treated as an element of a country's openness to and integration with the rest of the world in a dynamic setting[105]. The location-specific advantages of labour abundance in developing countries, foreign direct investment creates jobs, especially in labour-intensive industries. The total amount of employment created by foreign direct investment in Thailand has been increasing rapidly with the growth of labour-intensive export-oriented industries in recent years[106]. Finally, although the optimum levels of technology transfer may still be a debatable issue, the occurrence of significant technology transfers through foreign direct investment in Thailand is confirmed[107].

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[104] Lecraw, 1977, pp. 445-446, 456.

[105] Kojima, 1978, p. 45.

[106] Lim and Fong, 1991, p. 90.

[107] Iamjitmetta, 1989, pp. 56 -57.

Observations

In the light of the findings of this study some concluding observations are in order.First of all, the role of government intervention is still important in terms of the provision of infrastructure facilities. Adequate infrastructure facilities lead to an improvement of efficiency, and competitiveness of domestic production. FDI is not only encouraged but better utilised with improved facilities.

Secondly, given the planners' liking for certain investment promotion strategies, it is advisable that incentives be used to encourage investment in specific industries which have the international comparative advantage. On the other hand, foreign investment that exploit resources uneconomically and/or for the benefit more of the investing countries should be strictly discouraged. Moreover, since the effect of urbanisation on foreign direct investment is sufficiently important, inducements for further decentralisation of industries should be brought in to provide better facilities around selected new locations rather than clutter up the existing ones even more.

This study has not addressed several issues such as for example the question of joint ventures between investors and any overseas collaborators in third countries with potential for growth and diversification. Also, the intra-industry linkages generated by increased invesment and the economic nature of such linkages must be known, and investments must be planned on such knowledge. These are issues for further research.

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