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Foreign direct investment and economic growth : evidence from Asean countries

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FOREIGN DIRECT INVESTMENT AND ECONOMIC

GROWTH: EVIDENCE FROM ASEAN COUNTRIES

by

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Submitted for the degree of Ph.D

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Abstract

This thesis studies the two-way relationship between economic growth and FDI. Three main hypotheses are put forward: (1) There is a two-way relationship between FDI and economic growth: FDI contributes to higher economic growth and in turn high economic growth attracts more FDI; (2) The implementation of an Export-Oriented Regime (EOR) strengthens this two-way relationship between economic growth and FDI; and (3) Human capital in the host country plays a positive role in this relationship.

The empirical work of this thesis is comprised of two parts: (1) an econometric analysis for four ASEAN countries: Indonesia, Malaysia, Singapore and Thailand during 1975-1995, using simultaneous-equation estimation for panel data; and (2) a qualitative study for Vietnam during 1985-2000, which includes case studies of three FDI firms in the automobile industry. Overall empirical results are consistent with the above hypotheses. In the four ASEAN countries during 1975-1995 there was a two-way relationship between FDI and high economic growth: FDI was an important growth-enhancing factor and high economic growth was a positive determinant of FDI. FDI contributes to the economic growth of the ASEAN countries mainly through its impact on exports and on technical progress. The results suggest that the two-way relationship between high economic growth and FDI in the ASEAN countries was conditional upon the implementation of EOR. Meanwhile, human capital was a positive and facilitating factor in this relationship. The thesis finds that in Vietnam in the 1990s (1) FDI contributed to and, at the same time, was attracted by high economic growth; and (2) the trade regime, including protection and EOR, played an important role in this relationship. However, inadequate human capital and underdevelopment of the domestic private sector made this relationship unsustainable in the late 1990s. The thesis also provides policy implications and suggestions for future research.

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Declaration

The material contained in this thesis has not been previously submitted for a degree in this or any other university

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Acknowledgements

Chapter I - Introduction

This thesis studies the two-way relationship between economic growth and FDI (Foreign Direct Investment)[1] in ASEAN (the Association of South East Asian Nations) countries This chapter outlines the background theme, identifies research questions, and describes the research design, the data sources, and the structure of the thesis

1 – Background

Foreign Direct Investment (FDI) was an important external financial resource for developing f until the early 1990s, decreased sharply Meanwhile portfolio equity flows increased but they could not match the increase in FDI flows

Table I.1 - Net Financial Resource Flows to Developing Countries (1970-2000)

(US$ billion)

	1970	1980	1990	2000
Long-term Debt	7	65 3	43 1	13 6
Foreign Direct Investment	2 2	4 4	24 1	166 7
Portfolio Equity Flows	0	0	3 7	50 9

Source World Bank (2002)

Along with the changes in external financial resources, the attitude towards FDI among developing countries changed dramatically Some countries, like Taiwan, Singapore and Malaysia, which have consistently pursued pro-FDI policies since the 1960s or 1970s, continue to promote and facilitate FDI Meanwhile in many other countries, attracting FDI did not become a policy priority, FDI regimes were not liberalised, and policy instruments were not used extensively to facilitate FDI until 1990s This recent trend in FDI liberalisation demonstrates increasingly intense competition among countries for a higher share in the rapidly growing flows of world FDI[2]. It represents not only domestic policy but also a major component of the broader

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[1] In this thesis FDI refers to inward FDI (more details see Glossary)
[2] See Oman (2000) for more on competition for FDI among countries

liberalisation movement to enhance economic efficiency across developing countries, encouraged by the World Bank and the IMF. This liberalisation programme is based on the belief that opening up of the economy to trade and foreign investment is the key to maximise economic growth[3]

Table I.2 –Growth of Real GDP per capita of Some Large FDI Recipients in the Developing World

(Annual Average Growth in Percentage)

Average (1960-1995)		Average (1980-1995)	
Malaysia	4 07	Malaysia	4 25
Hong Kong	6 05	Hong Kong	5 02
Indonesia	4 43	Indonesia	5 08
Korea	6 38	Korea	6 35
Singapore	8 77	Singapore	5 43
Taiwan	6 62	Taiwan	6 08
Thailand	5 16	Thailand	5 70
		China	6 17
Argentina	0 92	Argentina	-0 07
Brazil	2 97	Brazil	0 69
Mexico	1 77	Mexico	0 01
Egypt	2 45	Egypt	1 84
Developing Countries	1 65	Developing Countries	0 48

Source compiled from Pen World Data See Appendix I 1 for more details The list of top FDI recipients is from UNCTAD (1992 and 2000)

So what are the consequences of FDI liberalisation and of the rapid increase in FDI for developing economies? *Firstly*, not all developing countries have received as much FDI as they wish despite liberalisation efforts Since 1970 FDI to developing countries has been concentrated in only a few countries On average, the ten largest FDI recipients receive around two thirds of total FDI to developing countries[4] *Secondly*, not all developing countries that receive FDI have high economic growth Table I 2 shows that among large FDI recipients, only some countries, notably from East Asia had higher economic growth than the rest of the developing world. Some

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[3] See various issues of World Development Reports published by the World Bank
[4] From statistics in World Investment Reports (UNCTAD, various issues)

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other countries such as Brazil, Mexico and Egypt, although receiving large amounts of FDI, did not have high economic growth. It should be noted that in those countries that have both large amounts of FDI and high economic growth, trade liberalisation and human capital development have been extensively emphasised.

2 – Aims of the Thesis

The background section has shown that not all developing countries have been successful in attracting FDI or achieving high economic growth by promoting FDI liberalisation Nevertheless, the increasing importance of FDI as an external financial resource for developing countries has generated a huge literature about FDI, particularly its determinants and impacts on the economic growth of host developing countries There are however two big gaps in this existing literature. *First*, the existing literature tends to consider only one-way relationships between FDI and economic growth, i.e either the influence of FDI on economic growth or the influence of economic growth on FDI. Very few studies have recognised the possibility of a two-way relationship between FDI and economic growth and this mainly comes from the empirical angle, e g when the problem of endogeneity is found in estimations[5]. *Second*, there are only a few empirical studies about ASEAN countries, namely Indonesia, Malaysia, Singapore, Thailand and Vietnam, although these countries have been distinctive in their experience in promoting FDI and high economic growth They are also different from other countries in terms of their trade policy and human capital

This thesis contributes to the existing literature by studying the two-way relationship between economic growth and FDI in ASEAN countries The main research questions are

- **What is the nature and mechanism of the relationship between economic growth and FDI?**

- **What are the roles of the trade regime and human capital in the relationship between economic growth and FDI?**

This thesis fills the gap in the empirical literature by studying the dynamics and mechanism behind high economic growth and the attractiveness for FDI of five ASEAN countries

3 – Research Design

In answering the research questions set above, this thesis is designed as follows: *first* it develops a theoretical framework for the two-way relationship between economic growth and FDI, *second* it empirically tests the framework with data from five ASEAN countries

3.1 – Theoretical Framework

The theoretical framework of this thesis is based on the Keynesian-Kaleckian approach. Following Keynes (1936) and Kalecki (1954, 1970), the two main assumptions of this framework are: i) economic growth is demand-driven and productive-capacity-constrained and ii) the investment function is dependent on the marginal efficiency of investment

There are three main hypotheses in the framework:

1   *There is a two-way relationship between FDI and economic growth* FDI could contribute to higher economic growth and in turn higher economic growth could induce more FDI The channels through which FDI contributes to economic growth are through raising domestic demand for consumption, investment, and foreign demand for the country's exports It also promotes economic growth by improving domestic productive capacity. High economic growth attracts FDI because it positively influences the expected profitability of investment and the confidence of foreign investors

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[5] See e g Balasubramanyam et al (1996)

2   The implementation of an Export-Oriented Regime strengthens this two-way relationship between FDI and economic growth

3   Human capital in the host country plays a positive role in the two-way relationship between FDI and economic growth

3.2 – Empirical Work

The empirical work of this thesis tests the above hypotheses. It is comprised of two parts· the first part is an econometric analysis for Indonesia, Malaysia, Singapore and Thailand during 1975-1995; the second part is a qualitative study for Vietnam during 1988-2000

The econometric analysis is carried out using the simultaneous-equation system for fixed-effects panel data The thesis applies this technique because it can detect the existence as well as the mechanism of the two-way relationship between FDI and economic growth and obtain unbiased and consistent estimates. The use of panel data estimation increases the number of observations significantly, thus giving more information and more degrees of freedom, and making the regressions more efficient The panel data analysis is also better in detecting issues that are undetectable if time-series or cross-sectional analysis is used

This thesis carries out a qualitative study to examine the determinants and impacts on economic growth of FDI in Vietnam There are two main reasons for a separate study for Vietnam, which applies the qualitative approach. *First,* Vietnam moved from a central planning to a market-economy in the mid 1980s. This different background makes it not feasible to include Vietnam in the panel data analysis with the other four ASEAN countries *Second,* the lack of data, particularly on account of the short period of time between 1988 and 2000, prevents a single-country econometric estimation for Vietnam The qualitative study is based on a country visit that included factory visits and interviews with government officials, investment experts, consultants

and foreign companies' management It also includes a case study for three big foreign companies in the automobile industry. Ford Vietnam Limited, Toyota Motor Vietnam and Yamaha Motor Vietnam

4 – Data

The major sources of data for the empirical work are the World Development Indicators CD-ROM 2000 published by World Bank (2000), International Financial Statistics published by IMF (the International Monetary Fund) (various issues), Key Indicators of Developing Asian and Pacific Countries published by ADB (the Asian Development Bank) (various issues) and Pen World Data by Summer and Heston (1991) Data on human capital is from Collins and Bosworth (1996) Data about Vietnam is mainly from the Vietnam Statistical Yearbook published by General Statistical Office (various issues), Vietnam Statistics published by Vietnam Economy (various issues), Vietnam Investment Review (various issues) and unpublished data from Ministries.

5 – Structure of the Thesis

The rest of this thesis is structured as follows.

Chapters II and III review the existing literature about factors in host developing countries that determine FDI and the impacts of FDI on the economic growth of host countries, respectively.

Chapters IV and V develop a theoretical framework about the existence, mechanism and conditions of the two-way relationship between FDI and economic growth These chapters also empirically test hypotheses put forward by the theoretical framework in four ASEAN countries – Indonesia, Malaysia, Singapore and Thailand during 1975-1995 Chapter IV focuses on the role of the Export-Oriented Regime in the

two-way relationship between economic growth and FDI Chapter V studies the role of human capital development in the relationship.

Chapter VI applies the theoretical framework developed in Chapter IV and V to study the determinants and impacts on growth of FDI in Vietnam during 1988-2000. Chapter VII studies the impacts of FDI on employment and human capital in Vietnam with a case study of three foreign affiliates in the automobile industry.

Chapter VIII summarises and discusses shortcomings of the thesis It also discusses some policy implications and suggestions for future research

Chapter II - Location Determinants of Foreign Direct Investment:

A Review

Introduction

This chapter reviews the existing literature about the factors in a host developing country that determines its FDI Although world FDI flows increased rapidly in the second half of the 20th century, three fourths of such FDI flows went to advanced countries, notably the US and the European countries, and only one fourth to developing countries Among developing countries, a large proportion of FDI was concentrated in a small number of countries (UNCTAD, various issues) As world FDI has been unevenly distributed, this chapter reviews theoretical arguments and empirical evidence in order to have a thorough understanding of why some countries are more successful than others in attracting FDI.

To understand what firms look for in host countries and what host countries can offer to attract FDI, it is essential to understand why firms undertake foreign production Early explanations about FDI are derived from the Heckscher-Ohlin-Samuelson-Stolper (HOSS) model and from portfolio theory. The HOSS model[1] describes FDI as a channel for capital to move from capital-long countries to capital-short countries This is based on the assumptions of perfect markets, no transaction costs, and identical production functions in different countries The portfolio theory postulates that foreign investors are capital arbitrageurs, who, under the assumptions of no uncertainty, no risk and no barrier to movements, go abroad to earn the difference between domestic and foreign rates of capital

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[1] See Hirsch (1976), Casson (1987) and Caves (1996, Chapter 2) for further discussion about HOSS Model

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return[2] Though failing to explain the FDI phenomenon[3] due to their unrealistic assumptions, the HOSS model and the portfolio theory provide a *benchmark* for research about FDI, in which theorists build up their models by relaxing one or more assumptions of these early theories.

The work by Hymer (Hymer, 1960) is a pioneering study that relaxes the assumption of perfect markets of the HOSS model and portfolio theory. Hymer argues that in a *monopolistic market* it is not higher interest rates but profits derived from controlling foreign enterprises that induce firms to undertake foreign production abroad Yet only firms with advantages over other firms in the production of a particular product can exploit such profits. Meanwhile the product cycle theory (Vernon, 1966) postulates that *oligopolistic* firms establish foreign subsidies to retain their advantages in product innovations and minimise production cost Relaxing the assumption of no transaction costs, *industrial organization theory*[4] (Caves, 1971) demonstrates that vertical enterprises (adding a stage in the production process that comes earlier or later than the firm's principal processing activity) exist to *avoid ex-ante contracting costs and ex-post monitoring and haggling costs* that would occur under a contractual relationship The *internalisation theory* of Buckley and Casson (1976) asserts that FDI internalises the firm's advantages and replaces a set of institutional arrangements that have high transaction costs by a new set with lower transaction costs Caves (1971), Heillener (1973) and Rugman (1974) demonstrate that firms undertake FDI to *diversify* in risky and uncertain business environments FDI is also an activity that firms add to their portfolio to

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[2] See Hymer (1960) and Caves (1996) for a further discussion about portfolio theory

[3] See Heillener (1973), Hirsch (1976), Maki and Meredith (1986) and Casson (1987) for further discussion about the explanatory power of the two models

[4] For further details see Caves (1971 and 1996)

pursue a global competitive strategy (Rahman, 1983; Dent and Randerson, 1996, Chen and Chen 1998)

From the discussion of the theoretical background above, we realise the importance and interrelation of firm-specific factors and other determinants affecting firms' location decisions. Nonetheless, this chapter only deals with the theoretical and empirical literature that describes the characteristics of host countries that induce or deter FDI inflows in order to understand why some countries are more successful than others in attracting FDI This chapter is structured as follows· the next section reviews theoretical arguments about location factors of host countries that influence firms' location decisions Section 2 reports the empirical findings about location determinants of FDI with a special focus on ASEAN countries. Section 3 concludes the chapter

1 - Theories of the Location Advantages of Host Countries in attracting FDI

A critical review of the theories on host countries' location advantages is presented here to update the understanding about the factors of host countries that foreign investors consider[5]. This section begins with some early justifications on firms' decisions where to locate foreign production Next is the discussion on theories that focus on production cost differentials, which result mainly from labour cost differentials, economies of scale and exchange rates. The review then discusses the eclectic theory and the literature on host government policies. The literature on developing countries will be reviewed subsequently. Next are two issues on the geographical context of host countries, inter-country integration and intra-country concentration A rising amount of literature on FDI by Small and

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[5] Motives for foreign production could be different for different types of FDI, which are generally typified as resources seeking, market seeking, efficiency seeking and strategic seeking (see Dunning, 1993, chapter 3 for further details) and factors determining FDI decision For instance a firm that decided to go abroad to exploit bauxite would go to the host countries that possess such resource The determinants of such decision might include resource availability, labour cost and transportation cost

Medium Enterprises to explain their international operations and survival in the world dominated by giant multinational corporations also deserves a separate discussion. The last part of the review deals with the dynamic nature of FDI flows, i e. existing FDI attracts more FDI.

1.1 - Early Analysis about Location of Foreign Firms' Production

Though Hymer (1960) did not explicitly address country-specific advantages that attract FDI, he paved the way for later theorists by pointing to the *competitive imperfections* and the *distance* of host markets as determinants of FDI location

The *oligopolistic reaction theory* (Knickerbocker, 1973) postulates that when firms follow their rivals to enter a new market, the choice between exporting, licensing, or undertaking FDI depends on *the host country characteristics* (and the extent of *uncertainty)*. The leader firm, which first enters a foreign country, may consider host market size but this is quite "a poor indicator" for the followers who tend to counter the action regardless of scale considerations They need *rapid growth* and *socio-politico stability* of host market to assure scale advantage in the future The limitation of this theory, as noted by the author himself, is that it cannot explain why the leaders decide to embark on FDI in the country.

1.2 - Production Cost Differential as a Determinant Factor in Choosing a Foreign Location

One strand of literature argues that location decisions for firms' production abroad are determined by production cost differentials between home and host countries and between host countries The literature suggests labour cost, economies of scale and exchange rates as factors that influence cost differentials

1.2.1 - Labour Cost Differential and Economy of Scale

The *product cycle thesis* of Vernon (1966, 1979) postulates that firms move their production from home to advanced European countries and then to less-advanced countries as the production goes through stages of new, maturing and standardised products Production costs influence firms' decisions whether to export to or undertake FDI in European countries and whether to shift production to less-developed countries The most likely FDI recipients in the maturing stage would be European advanced countries with lower labour costs, economies of scales, and certain technological development[6]. Less-developed countries (LDCs) with very low labour costs are appropriate in the standardised stage

Horst (1973) argues that location decisions depend on the *absolute advantage in production costs* of host countries Specific determinants of location advantages are production costs including wages, energy costs, material costs and tax rates (Dunning, 1980) Buckley and Casson (1985) claim that location factors influence cost of production and these factors motivate firms to expand internationally

The *portable technology model* hypothesises that the production cost differential between home and host countries is a determinant of location decisions (Maki and Meredith, 1986) The literature on less-developed countries considers low labour cost as an important determinant for firms to locate their production in such countries because it reduces production cost substantially (see section 1 6 for further details)

Lucas (1993) develops a model of derived demand for foreign capital by a profit maximizing, multiple product monopolist, to explore the sensitivity of FDI flows to production cost, including cost of labour and capital, and the tax rate

Theories of this approach, however, focus on the differentials between home and host country's production costs and pay no attention to the cost differential among host countries Consequently they could, to some extent, explain the decision of firms to undertake foreign production and at best name the groups of host countries that investing firms are looking for. These theories are unlikely to make clear which country will be chosen among a group of candidates This approach is criticised as being *static* (Bartmess and Cerny, 1993) and *incomprehensive* (Dunning, 1980). A comprehensive theory of location must incorporate cost factors and market factors because firms will choose the location that best advances their overall goals (Dunning, 1980).

1.2.2 - Exchange Rates and FDI Location Decisions

Theories on the relationship between exchange rates and FDI flows are normally based on the hypothesis that the location of FDI should be determined by differences in production cost among the locations that are being considered, when converted to a common currency. Firms expect a *currency premium* for bearing uncertainty in foreign exchange rate because income streams are denominated in different currencies[7]. Consequently exchange rate movements and exchange rate risk, the factors that most closely relate to the process of currency conversion, have been documented Batra and Hadar (1979) argue that the existence of a *forward exchange market* in host country is a positive determinant since it helps foreign firms to reduce (or eliminate) exchange rate risk exposure

Cushman (1985) shows that fluctuations in the real exchange rate can lead to a variety of risk and expectation effects on FDI Uncertainty about future changes in real

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[6] The product cycle theory and Hymer's market imperfection theory could be used to explain the trend in 1950s and 1960s, when US firms played the leading role in investing in Europe with high technology to supply high-income demand

[7] Aliber (1970)

exchange rates may, however, induce FDI since foreign firms might reduce their exports to the country as a result of this risk expectation, and offset the export decline by an increase in FDI A foreign currency appreciation will lower foreign capital cost, thus stimulating FDI, but when costs of other inputs are affected, e g labour costs, this appreciation may reduce FDI Similarly Batra and Hadar (1979) argue that multinational corporations will benefit from host currency devaluation only if their foreign operations are profitable. Meanwhile Froot and Stein (1991), based on the capital market imperfection approach, suggest a negative correlation between the value of the host currency and the propensity of FDI with the assertion that currency movements alter relative wealth across countries A devaluation of the host currency leads to FDI flows taking acquisition of assets in such a country[8] due to wealth gains This study is limited to the extent that it attributes gains only from currency movements to firm's wealth gains, which can be attained by many other factors

If exchange rate movement is a rather short-term phenomenon, FDI on the other hand results from a long-term strategy and requires assessment of fundamental factors *There is doubt about the basic hypothesis of exchange rate theories, i e whether there is a long-term relationship between exchange rate movements and fluctuations in FDI flows* Existing literature on exchange rate movements is criticised as being able to explain only short-term fluctuations of FDI flows[9] Recognising this weakness of the existing theories, Rangan (1998) questions whether multinational corporations operate flexibly[10], i e whether they shift their foreign production in response to currency changes. Rangan finds evidence to support *"the modest-responses hypothesis"* and explains that *"the ability of*

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[8] This argument is based on the statement that increase in wealth stimulate agent's demand for investment
[9] Blonigen (1997) argues that exchange rate movements may explain short-run fluctuations in acquisition FDI that are more likely to involve firm-specific assets
[10] The potential of firms to operate flexibly is discussed by Lessard and Lightstone (1986), Ghoshal (1987) and Buckley and Casson (1998)

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multinational corporations to operate flexibly in the current period depends on strategies and actions they have adopted in previous periods" (Rangan, 1998, page 233)

1.3 - The Location Sub-Paradigm of the Eclectic Theory

The eclectic paradigm of Dunning (1973, 1977, 1980, 1981), which combines the mainstream theories on firm-specific advantage and internalisation with location theory, has been the most ambitious and comprehensive explanation of firms' foreign production Dunning's location hypothesis is concerned with *economic and political* country-specific variables that affect i) market size and character and ii) production and transport costs Dunning demonstrates that location determinants explain firms' choice between FDI and export. This thesis therefore ignores export-oriented FDI Rugman (1985), Teece (1986) and Caves (1996) also criticise the ability of the eclectic theory to explain firms' vertical and diversified activities. Another limitation of the eclectic paradigm is the assertion that firms can exploit their advantages **wherever** they wish (Dunning, 1980, pp 10), firms' ownership-specific advantages and location-specific advantages therefore are analysed separately In his recent paper Dunning (2000a) argues that the main contribution of the eclectic paradigm is the recognition of the *contextual configuration* of theories on FDI and location determinants and its add-on dynamic components[11].

1.4 - Can Host Government Policies Alter Flows of FDI?

A substantial part of existing literature is devoted to explaining how governments can encourage and discourage FDI inflows[12] Policies are different between governments in developed and developing countries but such policies may have a similar feature, i e to

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[11] Dunning (2000a) claims that recent economic events and the emergence of new explanatory variables have added to the robustness of the eclectic paradigm
[12] Hirsch (1976) admits that the weakness of his analysis is to ignore public policy issues which government can use to influence inward FDI

increase or decrease the level of FDI inflows by increasing or decreasing market imperfection levels (Brewer, 1993)

The extent and direction of host government policies' impact on FDI inflows has been a controversial issue Tariff and trade barriers are generally recognised as an incentive for import-substituting FDI but theories provide no link between this determinant and other types of FDI such as export-orientation Tax is argued to be an important factor, and, tax incentives may induce FDI However, it is argued this policy tool plays no role if the country does not possess good fundamentals and does not pursue a favourable and consistent policy toward FDI Theorists have been encouraging host policy-makers to employ non-tax policies such as fighting with corruption and red tape, strengthening the regulations relating to foreign investment and liberalising investment policies

1.4.1 - Tariff and Trade Barriers

Aliber (1970) proposes that tariffs are among the most important determinants of location decisions in a unified currency area In the trade domain, import-substituting FDI has long been hypothesised as a natural response to increase in trade barriers of host countries (Vernon, 1979, Buckley and Casson, 1976, Caves, 1982, Dunning, 1988, Balasubramanyam and Greenway, 1992, Milner and Pentecost, 1994) Barriers to trade are also a determinant of the choice between oligopolistic FDI and export (Smith, 1987, Rowthorn, 1992, and Motta, 1992) Maki and Meredith (1986) however argue that tariffs do *not* appear to be an important determinant, given production cost differentials[13]. The recent emergence of multinational economic alliances, e g. WTO, NAFTA, EU, and APEC, which create large free-trade areas and/or remove tariff and non-tariff trade barriers, has challenged the theories on the impacts of trade barriers in the location decision of firms.

1.4.2 – Taxation and Tax Incentives

Theories of the effect of taxation on firm location decisions are based on a single hypothesis, i.e the corporate income tax rate has a negative relationship with FDI (Heillener, 1973, Dunning, 1980, Loree and Guisinger, 1995; Lahiri and Ono, 1998) Lecraw (1991) argues that the tax rate is among the location factors influencing FDI inflows that are under government's direct and immediate control Consequently, some theoretical studies suggest host governments provide tax incentives such as tax concessions and subsidised profits to encourage FDI (Loree and Guisinger, 1995; Lahiri and Ono, 1998).

In contrast, tax incentives are viewed as costly for host economies and have not apparently made significant contributions to foreign investors' decisions (Heillener, 1973, Guisinger, 1986 and Oman, 2000) This stream of studies argues that fiscal and financial incentives may lead to a *prisoner's dilemma*, i e. unhealthy competition among countries and may even have negative effects on FDI inflows when investors regard host tax policy as unstable[14]. These theorists highlight non-tax instruments as more efficient policy tools

1.4.3 – Government Policies toward FDI

A comprehensive analysis by Brewer (1993) postulates that there is a wide range of government policies that may induce or discourage FDI The effects of such policies depend on the scope of the policies and vary across countries and across types of FDI Nunnenkamp (1997) argues that corporate strategies of foreign investors are adapted to *local factor endowmenst*, which can be shaped by host government policies, and *specialisation patterns*, which can also be pursued by the same subject te Velde (2001)

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[13] Maki and Meredith (1986)
[14] Oman (2000)

presents a comprehensive policy framework affecting FDI inflows including industrial policies, macro-economic policies and other non-economic policies

The effects of *fiscal and financial incentives*, including tax holidays, subsidised credit and some special privileges e g freedom from exchange rate control have been questioned. Christodoulou (1996) and Oman (2000) argue that fundamentals of a country rather than financial incentives may have a more important influence on the choice of foreign investors The ineffectiveness of these incentives-based policies may be because investors think that such incentives are unsustainable It may also cause disinvestments as it creates inequality for existing (earlier) investors

It is widely agreed that *rules-based policies*[15], including a favourable investment climate, establishment of Export Processing Zones (EPZs) and Special Economic Zones (SEZs), strengthened rule of law, efficient administrative procedures, privatisation of state-owned enterprises, and liberalisation of trade and investment policies (Heillener, 1973, Oman, 2000), have a significantly positive relationship with FDI. The absence of bureaucratic obstacles and corruption and participation in economic integration and treaties are also among the positive factors

An increasing emphasis is now on policies that encourage human capital formation, improve infrastructure, strengthen environmental and labour standards, and create stability and transparency, which may be more powerful methods to attract FDI (Florida, 1995, Storper and Scott, 1995, Nunnenkamp, 1997, Oman, 2000). More specifically, Nunnenkamp (1997) states that there is no promising alternative to macroeconomic stability and opening up as inducements to FDI inflows On the negative side, some policies are claimed as deterrents to FDI inflows such as performance requirements, and local content requirements (Loree and Guisinger, 1995; Lahiri and Ono, 1998).

So far literature provides no systematic understanding about the relationship between government policies and FDI Lecraw (1991) claims that policy makers have little information on which to base their decisions when they design policies to attract FDI te Velde (2001) recognises that *specifics need to be tailored to country-specific characteristics* A rising issue for host countries, especially developing countries, is thus to find out best-practice policies that make FDI work for their economic development

1.5 - Political Approach to Location Determinants

Scholars have documented the potential effects of a host country's political conditions on FDI as a sole subject[16], or simultaneously with economic factors[17] The common factors considered are the stability of the regime, the transparency of the system, the threat of nationalisation and the attitude towards private ownership and FDI

Sharpton (1975) postulates that political stability gives security for a new investment and is very crucial in international sub-contracting Schneider and Frey (1985) develop a *politico-economic model* that concentrates on political stability as an important determinant for a firm's location decision They argue " . [e]*ven if present economic conditions seem satisfactory and suggest good prospects for the future, it is entirely possible that they will not materialise due to unfavourable political conditions*" (page 165)

London and Ross (1995) examine the location rationale for FDI in the era of global capitalism. They assert that First World manufacturing investment seeks a more docile and less costly labour force in the Third World, emphasising a favourable balance of class forces They argue that *tightly controlled labour force* and *minimal class-based political*

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[15] Oman *ibid*

[16] Green (1972) and Thunell (1977)

[17] Heillener (1973), Lall (1978) and Agarwall (1980)

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and industrial disputes, i.e. less protest and fewer strikes, in a host country will result in lower production costs, thus attracting more FDI into the country.

1.6 - Theories on FDI to developing countries

A vast literature examines the emergence of developing countries in attracting FDI An early and comprehensive theory on this issue by Heillener (1973) proposes *low cost of unskilled-labour, limited distance, political stability, special concessions* (which may offset high labour and distance costs) and *easier safety standards* and *less stringent pollution legislation* as location advantages of developing countries The study predicts the trend in assembly and component manufacture for exports and the increase of incentives, subsidies and infrastructure improvements by host governments Later Sharpton (1975) attributes the growth of international sub-contracting in developing countries to cost differentials, especially *a cheap labour force*[18] and *a favourable environment* in host countries *Bureaucratic barriers* and an *over-valued exchange rate* are deterrents to FDI inflows A study by Lall (1978) identifies *a cheap but relatively skilled labour force, little or no labour problems*[19], *technological improvements* and *fiscal and infrastructure incentives* as factors that foreign investors seek for in developing countries Assuming that foreign capital is a perfect substitute for domestic demand, Lecraw (1991) argues that the stock of complementary resources such as infrastructure, education and a disciplined workforce in developing countries are determinants of foreign firms' decisions An increase in the amount of domestically supplied capital has a negative effect on FDI Recent literature attributes the rise of NIEs and ASEAN countries to be among the most significant FDI recipients to liberalising, export-led and FDI-led policies[20].

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[18] Sharpton argues that even big differences in labour productivity can be offset by labour cost differences
[19] A similar view is shared by London and Ross (1995)
[20] Chia (1999) and Nunnemkamp (1997)

1.7 - Theories on Economic Integration

Multinational economic integration is a significant feature of the global economy with the birth of trade blocs e g. EU, NAFTA, APEC and ASEAN Theorists have widely agreed on the positive impact of economic integration on FDI This positive relationship is originated from firms' intention to avoid protectionism, anti-dumping duties agreements and being bloc outsiders.

FDI is hypothesised to be a means for firms to enter an economic bloc Rugman and Verbeke (1991), Ozawa (1993), Almor and Hirsch (1995), and Dent and Randerson (1996) share the idea that firms undertake FDI in Europe to transform them into insiders for the *fear of being excluded* from the EU market. Balasubramanyam and Greenaway (1992) argue that the Single Market Program 1992 might stimulate inwards flows of not only export-oriented FDI, but also bridgehead and rationalisation FDI, which aim at serving the wider European market

Although the literature suggests that a country that enters an economic alliance may improve its location advantages and attract more FDI inflows, which of these will be improved and to what extent is still controversial Dent and Randeson (1996)[21] and Chia, (1997) argue that bigger market size may be attained. Meanwhile according to Scott (1996) and Motta and Norman (1996) market accessibility rather than bigger market size will be improved upon entry into economic alliances, in which countries give up their economic sovereignty in exchange for wider access to resources and markets Host countries should reduce internal barriers to trade (rather than co-ordinate on tougher external trade policy) to increase FDI and the benefit from economic integration (Motta and Norman, 1996) Blomstrom and Kokko (1997) provide a conceptual framework for the effect of regional

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[21] Dent and Randerson report that for Korean firms European market is a prosperous market in term of size and prosperity and a natural alternative for American market

investment agreements on the flows of FDI, showing that this issue has a multi-dimensional character, and that such effects depend on location, the competitiveness of local firms, the motives for investment, and how an agreement affects the policy environment in participating countries.

1.8 – Agglomeration Economics and Clustering

While there is an increasing trend in global integration, the intra-country regional concentration of economic activities has also been increasing. This paradox is explained extensively by agglomeration economics with three different perceptions, i e. urban agglomeration, spatial transaction cost and clustering agglomeration.

1.8.1 – Urban Agglomeration

The agglomeration effect is traditionally defined as a form of external scale economy in the location and organisation of industrial activity, normally associated with regional concentration of economic activities and co-location of related production facilities (Thompson, 1968, Kaldor, 1970, Ethier 1979, 1982, Walker, 1989, Davis and Rosenbloom, 1990, Krugman 1991a, b, Markusen, 1990, 1996)

Comparative advantages of a region are based on its *static efficiency* (Porter, 1996), i e natural resources, physical labour, and economies of scale, access to inputs, infrastructure and communications Firms in the same industry tend to concentrate in particular regions because proximity generates agglomeration effects Markusen (1990) shows that the regional grouping of specialised service suppliers lowers unit costs of final products through labour division in intermediate input markets According to Head et al (1995) and Markusen, (1996) government inducements can have influence on this geographical pattern of manufacturing

1.8.2 - Spatial Transaction Costs

Distance remains a problem affecting the location decisions of firms, especially in a sub-national decision. Vernon (1974) and Blackbourn (1982) suggest that foreign firms will locate in well-known and *accessible* regions that provide well-developed infrastructure, large market and agglomeration economics Scott (1996) argues that when the competitive advantages[22] of a region are high, firms' location strategies readjust according to levels of spatial transaction costs. If these costs are high firms gain from agglomeration; if they are low firms disperse to the place where cost-advantages are available

1.8.3 - Clustering and Learning Regions

The development of telecommunication and transportation infrastructure that decreases transaction costs is likely to diminish the importance of the arguments about spatial transaction costs. Nevertheless the new era of knowledge-based global capitalism[23] requires *dynamic efficiencies* both from firms and from host regions As for host countries, location advantages lie in the rate of learning and capacity for innovation, especially for high-cost countries (Florida, 1995, Porter, 1996, Audretsch, 1998). From this point of view, regions with highly specialised knowledge, technological know-how, locating specialised infrastructure, inputs and institutions, e g trade associations, market research, technological centres, have comparative advantages over others (Storper and Scott, 1995; Porter, 1996; O'Huallachain, 1996) The reason for regional clustering is elucidated by geographic proximity, which matters in transmitting knowledge (Porter, 1990; Audretsch, 1998)

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[22] Comparative advantages include supply of particular inputs, the ability to acquire such inputs without delay, supply of suitable trained, habituated and disciplined labour at reasonable cost
[23] Florida (1995)

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In this new context, governments are advised to reappraise their policies toward the creation and commercialisation of knowledge, encouraging a more flexible and decentralised regulatory framework and inter-regional coordination (Porter, 1990; Storper and Scott, 1995; Audretsch, 1998)

1.9 - Linkage Theory and FDI by Small and Medium Enterprises (SMEs)

A branch of the literature postulates that firm-specific advantages of big firms are different from those of SMEs and that the location factors that influence FDI by big firms are different from location factors that influence FDI by SMEs Big firms are recognised to be technologically superior and to have economies of scale, mainly originated from developed countries. Meanwhile small and medium firms are from both developed and developing countries, and possess superiority in small-scale and flexibility (Wells, 1983). FDI from SMEs is small in bulk but large in terms of affiliates (Buckley, 1989).

Theories suggest a variety of location advantages that SMEs consider in undertaking FDI. A small domestic market is the best place for firms with small-scale production to exploit their superiority (Wells, 1983) Fujita (1995) describes the fact that SMEs tend to concentrate in developed countries or in the "most developed" in terms of infrastructure and other environmental factors in the developing world He suggests that the perceived or actual difficulties of setting up may be a reason preventing SMEs investing in other developing countries.

The *strategic linkage* theories propose that SMEs look for strategic resources such as market intelligence, technological know-how, and management expertise in host countries to offset their weaknesses (Porter and Fuller, 1986, Nohria and Garcia-Pont, 1991, Hennart and Park, 1994) Meanwhile the *network approach* views FDI as a construction between domestic and foreign networks (Lindblom, 1977, Johanson and Mattson, 1987, Ozawa, 1993, Gomes-Casseres, 1997, Kohn, 1997, Chen and Chen, 1998)

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The linkage, through firms' suppliers, customers, designers and coordination between firms in the network, should be easily formed if networks in host countries are structured similarly to the ones in home countries Markusen (1990) demonstrates that when a firm enters a region, it can promote the creation of specialised service suppliers, and therefore enhance the advantages of the region Though it is not the sole determinant, the network linkage may interact with other local factors to influence firms' location decision

1.10 – The Partial Equilibrium Model and the Dynamic Features of FDI

While a substantial part of the literature focuses on *static* determinants of FDI locations, the partial adjustment model emphasises *dynamic* determinants, namely, the self-perpetuating growth of FDI over time (Cushman, 1987; Head et al , 1995, O'Huallachain and Reid, 1997; Cheng and Kwan, 2000) Cushman (1987) assumes that each year firms formulate a desired stock of FDI abroad based on various factors, however FDI flows are given by the partial adjusted model because various constraints prevent complete adjustment to firms' goals On a national scale Lecraw (1991) demonstrates that flows of FDI are an adjustment of FDI stock in response to changes in the optimum stock of FDI in the country.

Acording to Billington (1999) FDI inflows can depend on the existing capital stock in the host country, particularly the existing FDI stock However the net effect is quite ambiguous, it can be positive but can also be negative Adding to the existing stock is perhaps less risky and costly once the firm has established in that location, but if the firm in question has already invested the optimum amount of capital in that location, higher return might be achieved by investing in a new site. Cheng and Kwan (2000) claim that a *"positive feedback"* or *"self-reinforcing"* effect propels the FDI stock toward equilibrium

(even without the inducement of policy and other determinants of FDI)[24] The process towards equilibrium is gradual rather than instantaneous.

The clustering (section 1 8 3) and network linkage (section 1 9) literature also suggests the dynamic nature of FDI flows. A firm's decision to invest in a region can reinforce the area's attractiveness for other investors[25]. Head et al. (1995) argue that causes of industry localisation have been based on histories, more specifically, initial investments (by Japanese firms) spur subsequent Japanese investors in the same industry or industrial group to select the same location

2 - Empirical Work on Host Country Location Characteristics: A Review

Empirical work on the location characteristics of host countries is huge in terms of samples studied, methodologies applied and factors tested From a theoretical background, researchers realise that firms with different motivations will seek different factors in a host country It is widely accepted that natural-resource seekers will go to countries that possess such resources, market-seeking investors will go to large and prosperous markets However there are some common factors in a host country, for instance political stability and a favourable investment climate that foreign investors though motivated differently, may all seek for It is highly recommended by theoretical and empirical literature that a study on this topic should analyse common factors that foreign investors will look for and then disaggregate investment flows according to motivations, nationalities (or regions of origin), industries, and the firm size of investors Nonetheless the constraints in getting

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[24] This equilibrium level is being continuously altered because these determinants do change over time
[25] Markusen (1990)

such data and the intention to keep a simple model prevent researchers from including the variables that might be relevant[26].

Empirical literature has been attempting to analyse outward flows of FDI so as to identify host country factors that a group of investors from the same country (region) and/or same industry consider when they invest abroad Inflows of FDI have also been studied to identify the advantages of locations. Some papers try to find evidence why investors choose a particular location (national or sub-national) but not some others The goal of this section is to report the most significant factors of host locations that have impacts on FDI Table II 1 (page 61) provides a summary of the main empirical findings on location factors of host countries that determine FDI. A brief review on the pattern of empirical research and the methodologies employed will be presented

The main part of this section is the report on the most significant factors of host locations at a *national level* influencing the amount of FDI inflows, divided into three groups, namely *business prospects, cost-relating factors and the overall business environment.* The business prospect group refers to the potential market, including domestic and export market for foreign affiliates. The cost-relating variables are those that influence production costs such as labour cost, exchange rate volatility, inflation and taxation. The overall business environment variables are measures of government hospitality toward FDI and other government-relating factors that foreign firms face when they do business in the country such as bureaucracy and red tape. The boundary of this classification in some cases is unclear One variable can be fitted into more than one group,

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[26] Billington (1999) shows a rather opposite and extreme view that a host country is not going to be so concerned about from which country/region the foreign investment originates, neither are they likely to be concerned about why firms choose to invest abroad rather than in their domestic economy The host country's only concern is how much FDI inflows will be attracted into the country, therefore empirical research can ignore firm-specific features of investment flows

for instance bureaucracy is a government quality factor but its presence also incurs costs for firms.

The location advantages and disadvantages of three remarkable FDI recipients, UK, US and China will be discussed at national and sub-national levels The last issue of this review will be evidence from empirical findings of studies on ASEAN countries, which is the core analysis of this thesis.

2.1 - A Review of the Patterns of Empirical Research

2.1.1 - An Appropriate Measure of FDI

Most studies on FDI use monetary values for measurement of the amount of FDI (flows and/or stock)[27], while sometimes the number of affiliates as a rough estimate of this flow is used alternatively. Given the monetary term, a number of forms have been used for FDI data such as FDI inflows or stock at a certain point of time, in a certain period of time, in gross and net terms, or as change of flows between two points of time The absolute amount of FDI is employed frequently but it is not rare to see the use of FDI inflow as a ratio of GDP or per capita in order to correct for variations in market size.

2.1.2 - Studies on Inward Flows of FDI

Scholars show wide interest in investigating the location determining factors of a specific host country, ranging from a big and prosperous country like United States[28], to a smaller advanced economy like United Kingdom[29] and a recent emerged leading FDI recipient like China[30]. Some empirical work is conducted for a number of countries, grouped by some common characteristics e g studies on less-developed countries[31],

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[27] For the sake of simplicity and data availability this term might not reflect the actual volume of investment since FDI is a package of capital and intangible assets such as management expertise and technology
[28] Ray (1989) and Co (1997)
[29] Blair (1987), Milner and Pentecost (1996), Thomsen and Nicolaides (1991) and Billington (1999)
[30] Liu et al (1997) and Dees (1998)
[31] Root and Ahmed (1979), Schneider and Frey (1985), Lecraw (1991), Woodward and Rolfe (1993), Tsai (1994), Gastanaga et al (1998)

advanced countries[32] and transition economies[33], by geographical proximity such as European countries[34] and Asian (and Pacific) countries[35].

Some studies attempt to employ relative terms in order to explain the comparative advantages of some locations over others[36] Despite several attempts to break down the aggregate amount of FDI according to country of origin or industry, most scholars are not able to do so, thus only common factors that influence FDI have been identified Though studies on inward flows of FDI have been successful to a certain extent in identifying the significant factors of host locations, the advantages of host locations over others have not fully examined

2.1.3 - Studies on Outward Flows of FDI

A large part of the empirical literature attempts to identify the location factors that foreign investors from the same country look for, for example FDI flows from US[37], Japan[38], UK[39] and Taiwan[40] This approach provides an insight from firms' perspective, especially cultural proximity. However other firm-specific features such as industry or size are generally ignored Studies on FDI outflows attempt to name host location determinants that have impacts on such flows but generally fail to differentiate among locations.

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[32] Cushman (1985)

[33] Smarzynska and Wei (2000)

[34] Blair (1987), Heitger and Stehn (1990), Balasubramanyam and Greenaway (1992), Dent and Randerson (1996)

[35] Lucas (1993), Tsai (1994), Jackson and Markowski (1994), Goldar and Ishigami (1999)

[36] Blair (1987) with the advantages of UK over other EU countries, and Dees (1998) with the relative advantages of China over Southeast Asian countries

[37] Kravis and Lipsey (1982), Cushman (1985), Maki and Meredith (1986), Blair (1987), Grubert and Mutti (1991), Wheeler and Mody (1992), Loree and Guisinger (1995), Milner and Pentecost (1996), Barrel and Pain (1996), Lee and Mansfield (1996)

[38] Ray (1989), Balasubramanyam and Greenaway (1992), Goldar and Ishigami (1999) and Urata and Kawai (2000)

[39] Pain (1997)

[40] Chen and Chen (1998)

2.1.4 - The Methodologies and Techniques

Empirical studies of the location determinants of FDI are normally conducted with fieldwork and statistical techniques Studies based on fieldwork[41] with surveys and questionnaires, are normally designed to ask interviewees about the factors that affect their location decisions (ranging from the most to the least likely) Despite having several shortcomings, such as sample bias due to low response rates and the subjective judgement of respondents (Dunning, 1993, pp. 139), this methodology has been applied widely due to its important findings about the evaluation of less quantitative variables like the host economic environment and government polices toward FDI, which cannot (or are unlikely to) be obtained using the statistical methodology alone

Statistical techniques have been a powerful tool for researchers to find the most significant explanatory variables that have impacts on FDI. This method has comparative advantages over the fieldwork due to the availability of statistical data although the consistency and reliability of different sources of data remains an obstacle A large part of statistical-based research applies econometric techniques on i) cross-sectional, ii) time-series and iii) pool data to identify location determinants of FDI flows Studies on *cross-sectional* data[42] examine flows of FDI into some specific locations at a certain point of time (or sometimes between two points of time). This technique can explain the influence across locations but not over time On the contrary, studies that employ *time-series* analysis[43] are able to measure the impacts of locations on FDI inflows over time but not across locations The pool of cross-sectional and time-series data has been considered as an

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[41] See Dunning (1973, 1993) for a review of previous field studies Some recent field studies include those conducted by the Ministry of International Trade and Industry every three years on Japanese firms, by Chen and Chen (1998) on 554 Taiwanese firms

[42] Some typical examples of cross-sectional studies are Maki and Meredith (1986) for US FDI to 41 Canadian manufacturing sectors in 1975 and 1980, Heitger and Stehn (1990) for Japanese FDI to Europe in 1985-1986, Loree and Guisinger (1995) for outward flows of US FDI with the benchmark of 1977 and 1982

appropriate method for the studies on FDI determinants. This technique allows researchers to analyse in depth, complex issues that might not be possible using time series and cross-sectional data alone[44]. Sophisticated econometric techniques have been used in order to improve the explanatory power of empirical work such as Generalised-Least-Squares (GLS), Quasi-Three-Stage-Least-Squares (Q3SLS), Seeming Unrelated Regression (SUR) and two-step estimation procedure Statistical techniques such as variance analysis[45] and multiple discriminant analysis[46] have been adopted, especially for less-easily quantifiable factors.

Given the pros and cons of the fieldwork and statistical methodologies, a combination is highly recommended, in which the statistical analysis identifies quantifiable factors and estimates their overall impacts in numeric terms, while the fieldwork covers the limitations of the statistical work by dealing with less-easily quantifiable variables

2.2 - Empirical Findings on the Location Determinants of FDI

This section reviews the empirical findings of cross-country analyses of FDI determinants Location determinants are divided into three groups, determinants that influence business prospects, determinants that affect production and determinants that affect the overall business environment in host countries.

2.2.1 - Location Determinants Influencing Business Prospects of Foreign Production

2 2 1 1 - Market Size and Growth

Market Size

A big and prosperous market, which offers benefits of large-scale production, higher income and potentially, more sales of foreign affiliates is expected to have a

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[43] Blair (1987) examines time-series data of US FDI to UK and EEC for the period of 1954-1983 and 1958-1983, respectively Barrel and Pain study the outward flows of US FDI in the 1970s and 1980s

[44] Examples of panel data studies are Cushman (1985, 1987), Lecraw (1991), Wheeler and Mody (1992), Co (1997), Dees (1998) Goldar and Ishigami (1999) Gastanaga et al (1998) and Wei (2000)

[45] Chen and Chen (1998)

positive relationship with market-seeking FDI The most popular proxies for market size are Gross National Production (GNP) and Gross Domestic Production (GDP), which are used mutually[47] without any specific reason. These proxies are used in nominal terms, real terms[48], and per capita[49]. Some studies attempt to use relative rather than absolute terms of market size to explain the comparative advantage of host countries[50].

Scholars also employ some other proxies for host market size such as domestic demand[51], consumption spending[52] or sector output[53] Some studies use the size of export markets[54] and the accessibility to other markets[55] for developing countries, which usually serve as export platforms for foreign investors It is argued that the size of the region rather than that of the domestic economy when a country joins an economic bloc matters, especially for studies about EU members[56]

Empirical research provides mixed evidence about the impact of market size over the FDI inflows It is reported that host market size has a significantly positive effect on FDI to developed countries and developing countries[57]. Market size is more important

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[46] Root and Ahmed (1979), Jackson and Markowski (1994)

[47] Studies that use GNP are Schneider and Frey (1985), Cushman (1987), Culem (1988), Ray (1989), Barrel and Pain (1996) Studies that use GDP are Root and Ahmed (1979), Blair (1987), Loree and Guisinger (1995), Billington (1999)

[48] See for example Schneider and Frey (1985), Gastanaga et al (1998)

[49] Among studies that use GDP/GNP per capita, Grubert and Mutti (1991) find that high GDP per capita may have an additional effect on US FDI if US goods are characterised by higher income elasticities of demand and also a more productive workforce

[50] Culem (1988) with a measure of host over home market size and Blair (1987) with a proxy of UK GDP over that of EEC

[51] Culem (1988)

[52] Lucas (1993)

[53] Pain (1997)

[54] Lucas (1993) and Jackson and Markowski (1994) initiate the use of this proxy to reflect the export-orientation trend of FDI in Asia

[55] Wignaraja and Lall (1998) attribute the market access to EU, US and Africa to the success of Mauritius since the domestic market of this country is fairly small

[56] Milner and Pentecost (1996), Dent and Randerson (1996)

[57] Cushman (1985, 1987), Culem (1988), Barrel and Pain (1996), Pain (1997), Billington (1999), Schneider and Frey (1985), Goldar and Ishigami (1999), Urata and Kawai (2000), Kravis and Lipsey (1982), Wheeler and Mody (1992), Loree and Guisinger (1995)

when firms invest in developed countries[58] but scholars also find that the big domestic market of China is a positive determinant of this country's attraction to FDI[59]. Some studies however find market size an insignificant determinant of FDI to developing countries[60]. Regarding the size of an economic bloc, Milner and Pentecost (1996) find that the broader definition of the UK market, i e measured as the size of EU as a whole, rather than a narrow proxy of UK domestic market, plays a role in attracting FDI inflows (though both proxies are significant with the expected sign) On the contrary, Culem (1988) argues that the EU market size as a whole is not the right measure, the market size of individual country in the bloc is more relevant because members remain significantly partitioned.

Growth Rate of Market

A high rate of growth is hypothesised to play a more important role especially in the case of developing countries with the assertion that a high growth rate may offset the disadvantages of a small economy and limited market

Scholars in general, report the positive significance of the growth rate of GNP or GDP, especially in the studies of developing countries[61] The implication of this finding is that a high growth rate of a host country reflects potential market expansion, thus inducing foreign investors for a bigger and more prosperous market Schneider and Frey (1985) though reporting a similar result in less-developed countries, argue that growth rate of GNP is less important than real GNP per capita The absolute change of GDP/GNP, an alternative proxy for market growth is also reported with significant and positive effects[62].

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[58] Wheeler and Mody (1992), Urata and Kawai (2000)
[59] Chen and Chen (1998), Dees (1998)
[60] Root and Ahmed (1979), Loree and Guisinger (1995) Loree and Guisinger argue that the insignificance of market size in their study may reflect the fact that FDI flows cannot be segmented by market orientation
[61] Root and Ahmed (1979), Schneider and Frey (1985), Culem (1988), Tsai (1994), Chen C L (1997a), Goldar and Ishigami (1999)
[62] Chen, C L (1997a), Goldar and Ishigami (1999)

2 2 1 2 - Trade

Trade relations between home and host countries are documented as a positive determinant on the location decision where exports from home countries and FDI are complementary rather than substitutes[63]. Positive and significant effects of exports (in lagged form) by EEC firms on FDI flows from these firms to US is reported[64], indicating that previous export experience leads to subsequent FDI in order to consolidate such firms' US market share. Singh and Jun (1995) find that export orientation is the strongest variable for explaining why a developing country attracts FDI. Co (1997) and Goldar and Ishigami (1999) find that the higher are the imports from Japan, the larger are the FDI inflows from Japan to the host country. Billington (1999) finds significant and positive effects of imports on FDI to the UK. Liu et al (1997)[65] and Dees (1998)[66] find that the trade relationship between the home country and China induces FDI from that country to China Jackson and Markowski (1994) document that the extent to which inward trade is unhindered, which might reflect imports of capital goods, technologies and components from parent companies in home countries, significantly influences FDI. Export shares of GDP and export growth variables in Asia-Pacific countries are also found to have significant effects (Jackson and Markowski, 1994)

The trade balance is documented to have some influence on FDI[67] An increase in the trade deficit is expected to be associated with more favourable policies adopted by host governments to facilitate FDI[68] Tsai (1994) finds a robust and significantly positive effect

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[63] Co (1997) and Billington (1999)
[64] Culem (1988)
[65] Liu et al (1997) examine bilateral trade
[66] Dees (1998) regresses the share of home country exports on China activity
[67] Jackson and Markowski (1994) report significant effects of the per capita trade balance in non-energy raw material
[68] Fry (1983), Torrisi (1985), Tsai (1994)

of the trade deficit on FDI Goldar and Ishigami (1999) show that the greater the trade

deficit vis-à-vis Japan, the larger the FDI flows from Japan

Hypotheses and evidence on the relationship between the general *openness* relating

to trade and FDI are quite ambiguous Kravis and Lipsey (1982) find that a high propensity

to trade in a host country is a positive determinant though they are not clear whether this

statistically significant effect is because of better access to imported material inputs or

better transport and facilities for trade Chen C L (1997a) and Goldar and Ishigami (1999)

report a significant effect of openness, proxied by the ratio of the sum of import and export

and the country's GDP, on FDI to Southeast Asia. For the same proxy, Goldar and

Ishigami (1999) and Smarzynska and Wei (2000) report insignificant effects for FDI from

Japan to Asia and FDI to transition economies.

Tariffs

Evidence on tariff-jumping FDI, which is argued to be the only way to gain access

to a highly protected market, is fairly consistent with the theories Tariffs are found to have

a positive and significant relation with market-seeking FDI[69]. The inconsistency of the few

studies that report the insignificance of tariff[70] might be attributed to the sensitivity to the

estimation methods and specifications chosen[71]. Gastanaga et al (1998) point out the

correlation between tariffs and other potential determinants, leading to the decreasing

importance of tariffs in the later stages of projects[72].

2 2 1 3 - Competitiveness

Milner and Pentecost (1996) hypothesise that increased competitiveness in the host

country will reduce the opportunity for monopoly profits, therefore foreign investors will

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[69] Guisinger and Associates (1985), Culem (1988), Grubert and Mutti (1991), Barasubramanyam and Greenaway (1992), Dent and Randerson (1996)
[70] Maki and Meredith (1986), Mudambi (1995), Milner and Pentecost (1996)
[71] See Yannopoulos (1990) for a survey on trade barriers and FDI

be reluctant to invest in a country where competition is fierce. Measured by market concentration and import penetration, the result of this competition variable supports *"a restricted competitiveness hypothesis"*, i e. the lower the competition from other domestic firms and from imports, the higher FDI from US. Jackson and Markowski (1994) find domestic investment (as a percentage of GDP) in Asia-Pacific countries, which reflects investment opportunities that are not being exploited by domestic investors, a significant determinant for the growth of FDI Goldar and Ishigami (1999) report no effect of such a variable for South East Asian countries

2 2 1 4 - Economic Integration and Agreements

Empirical research has attempted to test the theoretical hypothesis that economic integration is a positive determining factor on intra-regional FDI and FDI from outside the region. Statistical studies have been conducted mainly on the impact of integration process on European countries Studies on other regional integrations such as the North America Free Trade Agreement (NAFTA) or the Association of South East Asian Nations (ASEAN) are few, possibly due to the insufficient availability of data. Results on the impact of economic integration on the region as a whole and on individual members are mixed, which is consistent with the postulation of the conceptual framework by Blomstrom and Kokko (1997) that such effects depends on characteristics of FDI and of individual countries

European Community

A general conclusion from empirical work is that the economic integration process of European Community members is likely to make the region a more attractive location for outside investors. This factor induces foreign investors to the EU market to become

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[72] They argue that tariff might be more important in the early period of project but over time trade liberalisation is a more important motive

insiders[73], or to respond to trade barriers[74] or just to enjoy a bigger market[75] The effect of the Single Market Programme 1992 is statistically significant and positive[76]. Research by the Netherlands Economic Institute and Ernst & Young in 1993 concludes that the European market as a whole has become more and more important Among few scholars who test the impact of European market integration on *intra-region FDI*, Pelkman (1984) and Pain (1997) report significant and positive effects from this variable.

Canada-US Free Trade Agreements (CUSFTA)

The essence of CUSFTA is a bilateral elimination of tariffs and the reduction of discrimination against bilateral FDI Blomstrom and Kokko (1997) observe that the pattern of FDI to Canada since the agreement does not suggest a strong and consistent influence of this agreement, partly because environmental change in Canada connected with CUSFTA was not dramatic. They also suggest a formal multivariate analysis on this issue in the future to obtain further reliable conclusions

Mexico and North America Free Trade Agreements (NAFTA)

In contrast with the case of Canada and CUSFTA, the joining of Mexico to NAFTA has been connected to a strongly significant environmental change in Mexico and a significant increase in FDI to Mexico, especially from countries outside the bloc (Blomstrom and Kokko, 1997).

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[73] Dent and Randeson (1996) for Korean firms, Almor and Hirsh (1995) for Israeli firms
[74] Heitger and Stehn (1990) for Japanese FDI
[75] Balasubramanyam and Greenaway (1992) for Japanese firms
[76] Thomsen and Nicolaides (1991), Balasubramanyam and Greenaway (1992), Almor and Hirsh (1995), Aarle (1996)

2.2.2 - Location Determinants that may Affect Production Costs of Foreign Production

2 2 2 1 - Labour Cost and Labour Characteristic

Theoretically and empirically, labour cost is among the priority concerns of foreign investors. Empirical research attempts to model not only wage costs but also labour quality as the latter might also have effects on overall labour cost

Two opposite hypotheses have been tested i) High labour cost has a negative impact on FDI because high labour cost will increase total production costs, thus lowering profits of foreign affiliates, ii) High labour cost has a positive or even no effect impacts on FDI because high labour cost may reflect high quality of labour force, which will not necessarily deter FDI, especially if such investments are capital-intensive, requiring a high-skilled labour force Different proxies have been tested for labour characteristics such as skill, productivity, availability and control of labour force

Labour Costs

The most popular proxy for labour cost, wage rate, is tested in different forms, e g hourly, weekly, monthly wage, wage in manufacturing or average wage of all industries, the absolute wage rate[77], the relative rate, which reflects researchers' attempt to examine relative advantages of host countries[78] (over home countries of investors or over other host countries), and in real terms[79]. Smarzynska and Wei (2000) even argue that GDP per capita can capture labour cost Labour cost adjusted for labour quality[80], e g productivity and

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[77] Schneider and Frey (1985), Wheeler and Mody (1992), Loree and Guisinger (1995), Wei (1997)

[78] Host labour cost relative to home labour cost can be found in Dunning *opt cit p* 7 and Lecraw (1991) for US outward FDI, in Pain (1997) for UK outward FDI, host labour cost relative to other host countries/regions is employed by Aarle (1996) for EU countries (labour cost of an EU country relatively to the rest of EU) and by Dees (1998) for China (Chinese labour cost relatively to that of East Asia)

[79] Cushman (1987), Aarle (1996)

[80] Kravis and Lipsey (1982) introduce wage adjustment for labour quality but fail to report the significance of this variable, which they explain partly due to possible failure to adjust correctly for quality differences and the use of average labour cost for all foreign affiliates in a given host countries Culem (1988), Chen C L

education, is argued as a more relevant proxy, which can measure the true effect of this variable on production costs, thus on FDI.

Findings from many studies confirm the negative effect of labour cost in attracting FDI[81] Studies on developing countries are generally consistent with the hypothesis that cheap labour cost has been a major driving force for FDI to these countries[82] Labour cost is found insignificant in some studies on developed countries[83]. In UK, for example, Billington (1999) finds that high national labour cost is unlikely to be a deterrent and what matters is local labour cost

Labour Quality

The availability of a semi-skilled and skilled-labour force at a reasonable cost is what foreign investors, especially efficiency-seekers from developed countries, look for[84]. The literacy rate[85] and school enrolment ratio[86] are popular proxies for the variable. The supply of this skilful workforce at comparatively low cost has contributed to the success of leading FDI recipients in the developing countries, such as Southeast Asia[87] and China[88]. The availability of a skilled-labour force at a relatively lower cost in UK is its location advantages over other EU countries, which helps explain the fact that UK has been the most important host country for FDI from US, especially in capital-intensive projects[89].

(1997a), Billington (1999) use labour cost allowing for productivity, Lecraw (1991) uses the quality-adjusted wage rate

[81] Liu et al (1997) and Dees (1998) for China, London and Ross (1995) for non-OECD countries, Wignaraja (1998) for Sri Lanka, Wignajara and Lall (1998) for Mauritius, Woodward and Rolfe (1993) for Caribbean basin countries, Chen C L (1997a) for developing countries, Cushman (1987), Culem (1988) and Aarle (1996) for advanced countries

[82] Kirkpatrick and Yamin (1981), Schneider and Frey (1985), Lecraw (1991), Wei (1997) for less-developed countries

[83] Wheeler and Mody (1992), Loree and Guisinger (1995)

[84] Markusen (1984, 1995), Dent and Randerson (1996), Milner and Pentecost (1996)

[85] In Wei (2000)

[86] In Schneider and Frey (1985), Cheng and Kwan (2000), Wei (2000), Urata and Kawai (2000)

[87] Chia (1999)

[88] Grub et al (1990), Dees (1998)

[89] Dent and Randerson (1996), Milner and Pentecost (1996)

The lack of skilled labour force is reported as a deterrent to FDI for many other developing

countries[90].

Availability of Workforce

There is no doubt that the availability of a workforce is a determinant of the

location decision since labour is an integral part of production. Among studies on this

issue, Friedman et al. (1992) and Billington (1999) who proxy labour availability by the

unemployment rate and find this proxy positively significant, report a pleasant implication

for governments who are battling with high unemployment that there is no need to reduce

the unemployment rate because it may mean higher workforce availability to foreign

investors, thus attracting more FDI In contrast, Lecraw (1991) find no evidence for the

change in labour force

Labour Control

London and Ross (1995) and Co (1997) find that labour control is consistent with

the theoretical hypothesis that tougher labour standards and a tighter controlled labour

force (e g fewer strikes and protest, less industrial disputes) induces FDI

2 2 2 2 - Exchange Rate

Given the hypothesis of a negative relation between host currency value and FDI

inflows, researchers model the effects of exchange rate movements and exchange rate risk

on FDI from two sides, i.e effects of home currency movements and effects of host

currency movements on FDI

On host currency movements, Ray (1989) reports a significant role for the

exchange rate in determining the location of FDI from Canada and Europe into the US

market in 1979-1985 No such evidence is found for Japanese FDI. Froot and Stein (1991)

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[90] Wignaraja (1998) for Sri Lanka, Wignajara and Lall (1998) for Mauritius, Urata and Kawai (2000) for Japanese FDI in other countries, especially Asia

however find a statistical and negative correlation between the value of the US dollar and Japanese FDI toward the US between 1973-1988. This strong effect is recorded in all industries and the strongest is in manufacturing and chemicals Depreciation of the renminbi is reported to induce FDI to China[91] Lecraw (1991) shows that exchange rates have a negative impact on export-oriented and resource-seeking FDI but not on market-seeking FDI. Woodward and Rolf (1993) in a study for FDI to the Caribbean basin find significance for host currency depreciation but not with the expected sign

Outward FDI is also hypothesised to respond to home currency movements. Cushman (1988) and Barrel and Pain (1996) find that FDI from the US is found to respond to expected short-run fluctuations in the US dollar, where the appreciation of the dollar over the host currency will reduce or postpone outflows of FDI from the US An appreciation of the yen has caused a surge in FDI from Japan, which is normally recognised as efficiency-seeking[92]. Another study on Japanese FDI by Urata and Kawai (2000) however reports the insignificance of exchange rates.

Mixed evidence on the effect of exchange rates indicates that exchange rates might not necessarily be important. The risk of exchange rate fluctuations may be more important for firms investing abroad who are risk-averse (Caves, 1996) Surveys and statistical analyses record supporting evidence for this hypothesis[93]

On the positive side for exchange rate risk, an increase in the uncertainty of future changes in real exchange rates might reduce exports and increase FDI as firms wish to decrease offset in exports[94]. On the negative side, Urata and Kawai (2000) argue that exchange rate volatility has a negative impact on FDI and this effect is strong especially in

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[91] Co (1997), Liu et al (1997), Dees (1998)
[92] Goldar and Ishigami (1999)
[93] See Caves (1996) for a further report on empirical evidence of exchange rate
[94] Cushman (1988)

developing countries Lucas (1993) finds a weak association between FDI and high foreign exchange reserves, which proxy a diminished prospect of currency depreciation Rangan (1998)[95] tries to test whether firms change their location of production in response to exchange rate fluctuations and finds that firms operate flexibly but in a moderate manner.

2 2 2 3 - Inflation Rate

Schneider and Frey (1985) postulate that a high inflation rate is a signal of internal economic tension and of the inability or unwillingness of the government and central bank to balance the budget and to restrict the money supply. They find this variable statistically significant and negative Woodward and Rolfe (1993) confirm the above result for FDI to the Caribbean basin Urata and Kawai (2000) find this determinant insignificant and conclude that inflation plays a discouraging role for the determination of Japanese FDI into developing countries On the contrary low inflation might be a sign of macroeconomic stability, which contributes to the attractiveness to foreign investors of some Asian countries over other developing countries[96]

2 2 2 4 - Taxation and Tax Incentives

The sensitivity of FDI to the tax rate has been reported in a number of empirical studies[97] Several statistical studies find the corporate income tax rate to have a negative impact on FDI[98], indicating that host governments, especially in developing countries, should lower corporate income tax to attract more FDI.

On the contrary, findings from some other studies, especially from field studies[99] are consistent with the hypothesis of recent literature that tax policy has little or no effect

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[95] Rangan (1988)
[96] Nunnenkamp (1997)
[97] Grubert and Mutti (1991), Mudambi (1995), Co (1997)
[98] Jackson and Markowski (1994), Loree and Guisinger (1995), Mudambi (1995), Wei (1997), Gastanaga et al (1998), Billington (1999), Wei (2000)
[99] Econometric studies are Wheeler and Mody (1992), Smarzynska and Wei (2000) Field studies are Ernst & Young (1994), Jetro (1995), Fortune/Deloitte & Touche (1997)

on the location decision Based on survey findings, Morriset and Pirnia (2000) conclude

that if tax policy matters it is not the most influential factor in the site selection process of

multinational corporations The same paper reports that "it is not true that tax policy (and

incentives) fail to attract investors, they do affect the decisions of *some* investors *some* of

the time". Lecraw (1991) reports the significant effect of tax policy on export-oriented and

resource-seeking FDI but not on market-seeking FDI He (1991) observes that the tax

sensitivity of FDI from the US is significantly greater within developed countries[100] than

developing countries[101]. Christodoulou (1996) reports that European corporate taxes were

converging because investors were giving increasing weight to a favourable tax regime

Hines (1996) shows that tax sensitivity might appear when foreign investors choose a sub-

national location rather than when they make a national-level decision

Given different points of view about the effect of tax policy, researchers show

different opinions about the effective of tax instruments and incentives On the no-effect

side, Wheeler and Mody (1992) argue that there is no need for tax and short-run incentives   .

if countries have good infrastructure development, specialised input suppliers and

expanding domestic markets According to a report by Ernst and Young (1994)

multinational corporations give more importance to simplicity and stability in the tax

system than generous tax rebates, especially in an environment with great political and

institutional risk

On the other hand, many scholars find favourable effects of tax incentives on the

volume of FDI[102]. Chen C. L. (1997c) provides an extensive study on the effects of tax

incentives in China, where he concludes that such policies have more impact on cheap

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[100] Developed countries generally have higher effective tax rates and tend to converge toward a group norm
[101] Developing countries have lower rates and tend to drift apart from one another in terms of their tax policies
[102] Grubert and Mutti (1991) and Dent and Randerson (1996)

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labour-seeking and export-oriented FDI than market-seeking and strategic-seeking FDI[103]

This positive relationship is also explained by saying that incentives may signal governments' positive attitudes towards FDI or their commitment to stimulate FDI[104].

2 2 2 5 - Infrastructure

It is commonly agreed that good infrastructure in terms of communication, transportation and energy supply, is necessary to induce FDI[105] Root and Ahmed (1979) document that investors appear to be attracted by countries whose governments directly participate in infrastructure programs Scholars employ various proxies to test the impacts of physical infrastructure, for instance the level of electricity generation per person[106]; government expenditure on transportation services[107]; transportation quality, and number of telephones per 1000 population[108] for telecommunication infrastructure. Woodward and Rolfe (1993) consider GNP per capita as a variable that provides information about the general quality of infrastructure of a country. Infrastructure quality is generally found to be significantly positive, indicating that governments should improve the quality of their infrastructure and use this as an instrument to attract foreign investors Good infrastructure is even argued to be more effective and worthwhile than fiscal and financial incentives[109].

2 2 2 6 - Geographical Distance

Geographical distance between home and host countries is hypothesised to have negative impacts on FDI as it incurs higher cost for management, information gathering

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[103] A similar view is shared by Guisinger and Associates (1985)
[104] Bond and Samuelson (1986), Woodward and Rolfe (1993)
[105] Wells (1987) and Rolfe and White (1992)
[106] Urata and Kawai (2000)
[107] Lecraw (1991)
[108] Jackson and Markowski (1994)
[109] Loree and Guisinger (1995) and Oman (2000)

and input transportation from parent companies[110] Findings on this determinant are generally consistent with statistically significant and negative coefficients[111].

2.2.3 - Overall Business Environment in Host Countries

2 2 3 1 - Government Policies toward FDI

Dramatic changes in policies toward FDI have been witnessed in the last few decades. Since the 1980s policies to promote export-led FDI and FDI liberalisation have replaced policies that promote import-substituting FDI in many developing countries[112] and have become a new trend in the globalised world. It is well known that such FDI regulatory regimes implemented by host countries may influence FDI Outward-oriented countries are more likely to attract FDI. Countries reluctant to follow this worldwide trend run the risk of being de-linked from corporate globalisation strategies pursued by multinational corporations[113], therefore are less likely to attract FDI.

There are several cases where the changes in government attitude toward FDI contribute to the success of the country in attracting FDI China is an example Since the issuance of the Joint Venture Laws in 1979 that permitted FDI for the first time, until 1983 every year this country attracted on average US$ 360 million of FDI, mainly to four Special Economic Zones (SEZs) which received special incentive policies The opening of 14 coastal cities in 1984 contributed to a remarkable upward trend with US$ 2.1 billion FDI per year on average between 1984 and 1990 Since then China has reached its peak with US$ 45,463 FDI in 1998 and US$ 35,331 in average between 1992 and 1999 This dramatic change is said to be due to the commitment toward the open door policy and market-oriented economic reforms, marked by the 1992 tour of Deng Xiaoping to coastal

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[110] For further details see Chen C L (1997a), Smazynska and Wei (2000)
[111] Wei (1997), Liu et al (1997), Smarzynska and Wei (2000)
[112] Nunnemkamp (1997), Chia (1999)
[113] Nunnenkamp *ibid*

cities and SEZs, along with a series of new policies and regulations to encourage FDI inflows and the change from special regimes toward nationwide implementation of open policies for FDI[114]. It is argued that export-led and FDI-led policies implemented by ASEAN countries make these countries become leading FDI recipients in the developing world[115] Outward-oriented FDI strategy in Sri Lanka and Mauritius since 1970s has been well recognised as a key issue for the success of these countries in attracting export-oriented manufacturing FDI[116]

Statistical studies on the effect of government policies toward FDI nonetheless are very few, possibly due to the complexity of the issue. Lecraw (1991) constructs an index for the openness of FDI in less-developed countries He finds that changes in openness have positive and significant effects on FDI, and concludes that government can influence FDI via changes in the openness or restrictiveness of their incentives systems Gastanaga et al (1998) also find that the degree of general openness to capital flows and to FDI[117] positively and significantly affects FDI Wheeler and Mody (1992) and Mudambi (1995) however report the insignificance of their policy variable[118]

Investment incentives are among the most popular policy tool that governments (at national and sub-national level) have been using to attract FDI. Most empirical studies[119] indicate that government incentives might be a determining factor but their importance comes after economic and political fundamentals Morriset and Pirnia (2000) and Oman

[114] Fukaska et al (1994) and Hill and Athukurula (1998)

[115] Hill and Athukurula (1998) and Chia (1999)

[116] Wignajara (1998) and Wignajara and Lall (1998)

[117] These indexes are from IMF's Annual Report on Exchange rate Arrangements and Restrictions

[118] Wheeler and Moody (1992) use an index of nine measures of government interventions, i e import restrictions, export requirements, local content requirements, price controls, profit repatriation controls, exchange controls and foreign equity limitations for existing and new investments Mudambi (1995) uses a group of policy variables, including limits on foreign equity participation, restrictions on foreign exchange usage, tariff and non-tariff barriers and the corporate tax regime, he finds that the effect of this variable is stronger in the equation stock of foreign capital and interprets this result as that policy variables may have insignificant effects in any one year but their effect tends to build up over time

[119] Hill and Athukorala (1998), Wheeler and Mody (1992), Nunnekamp (1997), Morriset and Pirnia (2000)

(2000) find evidence that the location decision includes two stages; first firms draw up a short list of locations based on economic and political fundamentals, then their decision is based on investment fundamentals, i e investment incentives

In most countries investment incentives and performance requirements have coexisted. Loree and Guisinger (1995) report that performance requirements normally have negative effects on FDI though such relationships may not be straightforward due to the presence of incentives. Performance requirements are reported with negative effects on FDI. Offering financial and fiscal incentives however may trigger unnecessary competition among countries[120]. The opportunity cost of incentives is high, especially for developing countries when incentives mean fewer resources for physical and social infrastructure investment[121].

Rules-based policy tools[122], including establishing Special Economic Zones (SEZs), privatisation, joining international regional-integration agreements, strengthening the juridical system, are suggested for governments as alternatives for investment incentives Woodward and Rolfe (1993) find that the size of free trade zones[123] has a positive effect on FDI to the Caribbean basin Chinese SEZs are also reported with positive impact on FDI[124] Although there is some supporting evidence, especially in East Asia and China, it is still under debate whether the benefits from such zones outweigh cost related advantages, and it may be a waste of scarce investment resources where not appropriately planned[125].

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[120] See Section 2 5 for further details on competition among countries
[121] Hill and Athukorala (1998), Oman (2000)
[122] Oman (2000)
[123] Free trade zones offer fiscal and tariff incentives, and freedom from foreign exchange control
[124] See Section 3 4 3 for details about Chinese SEZs
[125] Kinoshita and Mody (1997) and Magati (1999)

Transparency and coherence of the legal framework and of economic policy are empirically shown to play a positive role in enhancing FDI[126]. Using data from a questionnaire survey by the Japanese Ministry of International Trade and Industry (MITI), Kinoshita and Mody (1997) report a statistically strong influence of perceptions about host country's FDI policy in conditioning future plans to invest in the country Many governments that are successful in attracting FDI are also among those that best meet the requirements for good governance[127]

2 2 3 2 - Political Stability and Country Risk

Empirical research employs various proxies and most of them are indexes built by specialised organisations[128] to test the effect of political stability since this is a less easily quantifiable variable Political stability is reported with a significant and positive effect and political instability is a deterrent for FDI[129] When firms invest in East and Southeast Asia, concerns for political stability have overlain economic determinants[130] The strongly significant and negative effect of Tiannenmon Square dummy variable reported by Dees (1998) confirms the importance of political situation in investors' location decisions

Country risk contains wider content than political stability, ranging from nationalisation threat to the overall creditworthiness of the country Based on different

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[126] Kinoshita and Mody (1997), Chia (1999) and Oman (2000)
[127] Oman *ibid*
[128] Root and Ahmed (1979) use number of regular (constitutional) changes on government leadership over the period, Schneider and Frey (1985) use number of riots and strikes, Loree and Guisinger (1995) use International Country Risk Guide,
[129] Root and Ahmed (1979), Schneider and Frey (1985), Loree and Guisinger (1995), London and Ross (1995), Woodward and Rolfe (1993) and Wei (1997)
[130] Lucas (1993)

proxies[131], some studies find risk a significant determinant[132] while some others report little evidence[133].

2 2 3 3 - Corruption, Bureaucratic Delay and Contract Enforcement

Corruption is expected to have a deleterious effect on FDI. The presence of corruption is highly correlated with other dimensions of government quality such as the extent of bureaucracy and red tape (Wei, 2000) Since corruption is also not easily to be quantified, empirical studies employ different indexes such as the index of the absence of corruption of Mauro[134], The transparency International Corruption Perception Index[135] or the International Country Risk Group[136]. These indexes are reported with a strongly significant and negative effect on FDI. Good governance in terms of less corruption and bureaucratic is a positive determinant (Urata and Kawai, 2000) Bureaucratic delay is another negative determinant of FDI. In a survey of foreign investors doing business in Mauritius, more than 30% of the interviewers say that bureaucracy is a deterrent to their activities[137]. This is confirmed by results of a statistical study for less-developed countries by Gastanaga et al (1998) Gastanaga et al. (1998) also find that contract enforcement has significant impact on FDI Conducting a multivariate analysis of variance on investment profiles, Chen and Chen (1998) confirm that contractual risk is determining factor Wei (2000) argues that the presence of corruption indicates a general poor enforcement of contract by government

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[131] Flamm (1984) uses country dummy variable for differential risk, Wheeler and Mody (1992) use BI (Country Assessment Service of Business International Inc) index, Gastanaga et al (1998) use nationalisation threat from the BERI index
[132] Shah and Slemrod (1990), Lecraw (1991)
[133] Wheeler and Mody (1992) use a BI index, which contains political change, terrorism risk, expatriate environment, corruption quality of legal system etc Modambi (1995) considers five risk measures, including relationship with the West, with neighbours, peaceful transfer of power, regulatory environment faced by foreign companies and inflation
[134] Gastanaga et al (1998)
[135] Smarzynska and Wei (2000)
[136] Wei (2000)
[137] Wignajara and Lall (1998)

Relating to a specific aspect of the legal system, Lee and Mansfield (1996) test the sensitivity of FDI from the US to the strength and weakness of *intellectual property rights* in host countries Their results are consistent with the proposition that this factor affects the volume and composition of FDI, i e whether foreign investors would like to bring in newest or high technology to the country

2.3 - Evidence on Agglomeration Economics and Self-Perpetuating

2.3.1 - Agglomeration Economics

Empirical findings on a national level are consistent with the theoretical hypothesis that agglomeration economics are a positive determinant on firms' location decisions[138] Wheeler and Mody (1992) report the dominant agglomeration effect of infrastructure quality in developing countries and of specialised support service for industrial economies Dent and Randerson (1996) find that the presence of industrial clustering regions like the northeast is a location advantage of the UK With industry data of Swedish multinationals in 18 countries, Braunerhjelm and Svensson (1996) find that agglomeration effects, proxied by the share of employees in the industry in which the investing firm operates over all employees in the manufacturing sector in the host country, are present Clustering of potential suppliers, high-skilled labour, and information centres are also reported as sub-national location advantages in China and the US[139].

2.3.2 - Self-perpetuating Evidence

Evidence generally supports the dynamic hypothesis of FDI, i e the self-perpetuating growth of FDI[140] The presence of FDI in a country has a positive and statistically significant impact on new FDI[141]. Chen and Chen (1998) find the success of

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[138] Wheeler and Mody (1992), Urata and Kawai (2000)
[139] Head and Ries (1996), O'huallachain (1996), O'huallachain and Reid (1996)
[140] See Section 2 11 for theoretical discussions
[141] Wheeler and Mody (1992), Jackson and Markowski (1994), Mody and Srinivasan (1996), Head and Ries (1996), Chen C L (1997a, b), Cheng and Kwan (2000)

Taiwanese firms abroad is partly due to strategic and network linkages constructed with firms already established in the countries. Japanese firms are influenced by the presence of other Japanese firms in the country, which they feel more comfortable to do business with (Urata and Kawai, 2000) Kinoshita and Mody (1997) find that coefficients of past presence and perception about competitors' interest in that country have positive and significant impact on the decision of new investment Wheeler and Mody (1992) however argue that a self-perpetuating effect exists only when a certain development threshold has been reached

2.4 - Some Evidence of Location Determinants in the UK, the US and China

This section reports evidence on location advantages of three important host countries - the UK, the US and China - at national and sub-national level in order to see how investors choose a country and how they choose a site within the country.

2.4.1 - The United Kingdom

On a national level, location advantages of the UK include a large domestic market in terms of high GDP and high growth rate[142]; a high skilled labour force at a reasonable cost[143]; good infrastructure[144] and the English language[145]. The success of the UK in attracting FDI is due to overall appeal across a diversity of criteria[146] where the most important determinant is the commitment of the government to FDI[147]. At the sub-national level, labour cost and quality seem to be important for foreign investors (more than at a national level)[148] However financial incentives and assistance such as Regional

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[142] Hood and Young (1983), Dent and Randerson (1996), Billington (1999)
[143] Culem (1988), Ernst and Young (1993), Milner and Pentecost (1996)
[144] Ernst and Young (1993), Christodolous (1996)
[145] Balasubramanyam and Greenaway (1992), Ernst and Young (1993)
[146] Thomsen and Nicolaides (1991)
[147] Yuill et al (1994), Dent and Randerson (1996)
[148] Rees and Thomas (1992), Hill and Munday (1992), Billington (1999)

Preferential Assistance are empirically reported as the most substantially influential determinant on regional distribution of FDI within the UK[149]

2.4.2 - The United States

Location advantages of the world's leading FDI recipient, the United States, are a large market in terms of size, prosperity and growth prospect[150], and the availability of high technology[151]. Previous export from the home country to the US is also a positively determining factor[152] For the intra-State distribution of FDI, income of a State[153], labour cost and labour availability[154], tax[155], transportation quality[156] and local incentives[157] have been reported as significant determinants However the primary factor is agglomeration economics, which vary from regional production conditions[158], high industrial growth[159] to urban population[160] O'Huallachain (1996) and O'Huallachain and Reid (1996) describe the concentration of foreign firms in existing regions of production, which is consistent with theories on clustering agglomeration and show that an area with a pool of experience professionals and localised centres, which provide information to foreigners, is likely to attract more FDI

2.4.3 - China

Between 1978 and 1995 China received US$ 128 billion worth of FDI Recently, FDI to China accounted for 40% of total FDI to developing countries, making China the

[149] Hill and Munday (1992, 1994), Taylor (1993), Yuill et al (1994)
[150] Ray (1989), Bagchi-Sen and Wheeler (1989)
[151] Culem (1988), Chen and Chen (1998)
[152] Culem (1988) for FDI from EU, Co (1997) for FDI from Japan
[153] Friedman et al. (1992) employ personal income and a dummy variable for the access to major container port as proxies for potential market and argue that these variables can also capture effects of agglomeration economics
[154] Friedman et al (1992), Glickman and Woodward (1993), O'huallachain (1996), O'huallachain and Reid (1996)
[155] Hines (1996)
[156] Glickman and Woodward (1993), O'huallachain (1996)
[157] Mc Connell (1980), Arpan (1981)
[158] Arpan (1981)
[159] Ray (1989)

biggest FDI recipient in the developing world (Chen, H S 1996). The success of China could be explained empirically by its huge market in terms of size and growth[161] and cheap labour force Another crucial factor is the government commitment toward FDI along with wide-ranging incentives in Special Economic Zones (SEZs) and coastal cities at first and national-wide recently. These policies also provide investors with a transparent regulatory framework and economic policy coherence[162] Cultural proximity can also explain the surge of FDI from China's most important investors, Hong Kong, Taiwan and Macao[163].

The geographical distribution of FDI in China is however highly uneven Foreign investors have favoured and concentrated in the accessible eastern region, especially the SEZs and coastal cities[164]. The inter-city competition for FDI has been rising on account of the remarkable advantages of three regions, the east with developed transportation and telecommunication, the west and the middle with natural resources. Broadman and Sun (1997), Chen C. L. (1997b) and Cheng and Kwan (2000) find that regional income is a positive determinant, while Chen H S (1996) reports the significance of this variable only in the middle region with the explanation that foreign investors are competing to supply the underdeveloped middle market Though labour cost and productivity is normally significant in national-level studies, regional studies find no effect of this variable, possibly due to the fact that China overall offers low-cost labour. Findings generally support the infrastructure hypothesis, i.e the better is infrastructure quality (with different proxies[165]), the higher is FDI[166] Head and Ries (1996) find evidence on agglomeration economics

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[160] Bagchi-Sen and Wheeler (1989)
[161] Dees (1998), Chen and Chen (1998)
[162] OECD (2000)
[163] Wei (1997), Chen and Chen (1998), OECD (2000)
[164] Chen (1996)
[165] Chen H S (1996) with rail quality, Head and Ries (1996) with berths, railroads and airports, Chen C L (1997b) with highways, railways and transport waterways, Cheng and Kwan (2000) with roads, high grade paved roads and railways
[166] Chen H S (1996), Head and Ries (1996), Broadman and Sun (1997), Cheng and Kwan (2000)

while Chen H. S (1996) reports the negative relation between Research and Development quality (proxied by the ratio of a province's personnel in R&D agencies to provincial population), which contradicts the hypothesis of clustering theory The existing FDI in the province also stimulates more FDI[167]. Regional incentives are reported with positive and significant influence[168] although their proxies could not reflect the diversity and complexity of such incentive packages.

2.5 - Evidence on Competition among Countries to attract FDI

The issue of competition among governments to attract FDI has been a controversial issue On one side scholars argue that governments at national and sub-national level have been competing for their share of FDI[169]. Balasubramanyam and Greenaway (1992) find that positive inducements and performance requirements offered by European governments are negotiable in attempts to attract FDI from Japan, thus resulting in a likelihood of competition among EU members to attract FDI. Hill and Munday (1992) while highlighting the importance of incentives in attracting FDI, argue that this policy tool in turn can create the possibility of bidding between competing countries Tax and incentive competition among countries has been documented theoretically and empirically[170]. Though evidence on this issue is insufficient due to its diversification and complexity, evidence so far indicates that incentives-based competition is intense and widespread in both developed and developing countries. The most comprehensive report about competition among developing countries for FDI to date is that by Oman (2000) He reports that most incentives-based competition is effectively

[167] Head and Ries (1996), Chen C L (1997b), Cheng and Kwan (2000)
[168] Head and Ries (1996) use incentive zone dummy variable, Broadman and Sun (1997) use coastal location variables, Chen C L (1997b) use regional openness and policy changes in the early 1990s dummy variables, Cheng and Kwan (2000) use the number of SEZs, Open Coastal Cities, Open Coastal Areas, Economic and Technological Development Zones
[169] Lahiri and Ono (1998), Oman (2000)
[170] Keen (1991), Devereux and Griffith (1996), Lahiri and Ono (1998), Oman (2000)

intra-regional, or in other words, countries are competing with their neighbours. He argues that much of the real investment for which national (and sub-national) governments compete is the investment intended in principle for location in a particular region On the contrary, Dobson and Chia (1997) argue that attracting FDI to individual countries is a *positive-sum game* in which individual countries benefit from the success of their neighbour More extremely Thomsen (1999) argues that the notion that countries compete for FDI is a misconception FDI is not a *zero-sum game* with investors choosing one country at the expense of all others Indeed it is more likely that FDI to one country (in Asia) will spur further FDI throughout the region overtime.

2.6 - Empirical Studies on Location Advantages of ASEAN Countries

During the 1980s and 1990s, ASEAN countries (including Singapore, Malaysia, the Philippines, Indonesia and Thailand) were attracting a significantly high level of FDI in comparion with other developing countries[171]. Thus it is interesting to analyse how this region has managed and what are its location advantages. As Chia (1999) and some other authors have asserted, the success of ASEAN countries may be attributed to a combination of factors that include political, social and economic stability, buoyant economies with rapidly growing domestic markets, favourable factor endowments, development-oriented governments with sound macro-economic policies and pro-FDI policies

Nunnenkamp (1997) attempts to find out why Latin America has fallen behind Asia as host to FDI by comparing the location advantages of Asian (especially East and Southeast Asian) countries with those of Latin America. His analysis therefore can be helpful to understand the location advantages of ASEAN countries, especially the relative advantages over Latin America, the once-preferred host-developing region for FDI Nunnenkamp (1997) finds the advantages of Asia are the economic opening up in the

1980s, competitive advantages in terms of transaction cost-related barriers to FDI, development of technological infrastructure, transparency of public decision-making, macroeconomic stability, advanced human capital formation and better prospects of participating in globalised production Kindra et al. (1998), by interviewing investment experts, find that the ASEAN has attracted FDI based on its enhanced international standing as a profitable and internationally competitive region.

Though the leading role as FDI recipients and the comparative advantages of ASEAN countries are well recognized, there is still a lack of statistical evidence from formal empirical studies The three following studies, which analyse five ASEAN countries along with some other countries, are the most relevant to the issue

Based on a model of demand for foreign capital by multiple product monopolists, Lucas (1993) implements tests on countries individually and on the pool of two country groupings for ASEAN countries, South Korea and Taiwan Although he finds an association between enhanced size of domestic market with more rapid FDI inflows, Lucas emphasises the export-orientation of FDI to ASEAN countries. He reports the significant influence of major export market size and a greater elasticity of response of FDI to GDP in such export markets than in those of domestic markets Lucas argues that the inclusion of the domestic market alone may overstate the magnitude of this effect. The tests on individual countries provide mixed evidence on the effect of political stability and key episodes - significant in Indonesia and Thailand, insignificant in Malaysia, unclear for the Philippines and Singapore Lucas wipes out any agglomeration effects Though ending up with several important findings, this study lacks the evaluation of effects of policies on FDI, which is of great concern in the theoretical literature on this region.

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[171] UNCTAD (1992), Chia (1999), ASEAN (2000)

Within a mobility-modality framework[172] and using discriminant analysis, Jackson and Markowski (1993) report the gravity pull and specific factors of Asia-Pacific countries (including 5 ASEAN countries) in impeding FDI. This study confirms Lucas (1993)'s results on the importance of an *outward-looking stance* to attract FDI They find export share of GDP and export growth significant with a recognition that ASEAN countries serve as bases for launching exports. As in Lucas's study, the domestic market (GDP and GDP growth) though significant is not given much consideration. Another vital location determinant is past FDI attractiveness, which is significant for Malaysia and Singapore Jackson and Markowski (1994) also report the significance of some other factors such as low tax, infrastructure development (energy and telecommunication), language efficiency (English), and domestic investment

Goldar and Ishigami (1999) conduct a panel data analysis on FDI flows to Asia from 1985 to 1994 (five ASEAN countries along with China, East and South Asian countries) with a special focus on FDI from Japan They find strong and positive influences on FDI of GNP and the change in GNP Unlike Jackson and Markowski (1994) who find that a small ratio of domestic investment to GNP helps attract FDI[173], this study reports a significantly positive effect of this variable on FDI from Japan. However the effect is insignificant on total FDI Findings on trade propensity are unclear, with the degree of openness (as a ratio of import and export over GNP) significant in regressions for total FDI and insignificant for FDI from Japan. Meanwhile trade flows with Japan are found to be positive and significant

In contrast with the postulation that a large part of FDI goes to developing countries to seek low-cost labour there, that Newly Industrial Economies (NIEs) have lost

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[172] See full exposition in Jackson and Markowski (1993)

their attractiveness to ASEAN countries due to rising labour cost; and that now ASEAN countries have been losing their share of FDI to China for the same reason[174], labour cost is an insignificant determinant in Lucas (1993) and Jackson and Markowski (1994), and is not considered in Goldar and Ishigami (1999). As mentioned above, liberalisation policies and regulation regimes concerning FDI, which have been asserted to contribute a large part to the success of the countries, have been neglected in empirical research

3 - Conclusion

This chapter reviews the existing literature about the location factors of host countries that determine FDI. It finds that although the theoretical literature identifies a large number of location determinants of FDI, it seems that no single factor can be attributed to the success of a location and no single theory on FDI is able to stand by itself. Theories are complementary rather than substitutable because one should regard each theory as a partial explanation for a phenomenon that varies across firms, industries, countries and periods of time and thus[175]

The empirical literature attempts to identify either the location advantages of a certain area (or areas)[176] or the location factors that investors from a certain area (or areas) look for, applying different methodologies and proxies. Empirical evidence is moderately consistent with the theories Some mixed evidence and explanations have been obtained due to statistical problems and possibly due to the fact that empirical studies were not careful about satisfying the *ceteris paribus* conditions Overall, factors that generally have positive impacts on FDI to developed countries are the size and growth of the domestic

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[173] They show that Thailand offers investment opportunities to foreign capital as this is a small country with low capability to generate substantial domestic savings
[174] Goldar and Ishigami (1999), Urata and Kawai (2000)
[175] This survey shares a similar view with Professor Dunning (1993, 2000a)

market, the supply of skilled labour force, good infrastructure and overall favourable policies toward FDI. The existence of some economic bloc agreements and agglomeration economic effects also influence FDI positively High salaries and wages and high corporate tax rates in developed countries are found to affect FDI negatively. The empirical literature finds that the location determinants of FDI into developing countries are rather different from those into developed countries Like investors to developed countries, the size and growth of the domestic market, and the attitude towards FDI of host governments are important for foreign investors to developing countries However FDI to developing countries is particularly influenced by openness to trade, low salaries and wages, good infrastructure, and the state of political stability. In many cases the presence of FDI is found as a positive determinant of new FDI.

The existing literature is exposed to several shortcomings. The literature, while focuing on policies to attract initial investment, takes no notice of how to upgrade existing investors and prevent disinvestments Regarding the core sample of this thesis, i e. five ASEAN countries, this review has shown the gap in the existing empirical literature in explaining the location determinants of these countries The literature still seems ambiguous about the location advantages of five ASEAN countries and the impacts of government policies on the attractiveness of these countries to FDI It still does not answer the question whether these countries are successful in attracting FDI because they are among the earliest to open their doors to FDI at the time or because of other factors

While the theoretical and empirical literature provides no clear-cut answer on the location determinants of FDI and what a developing country could do to attract FDI, many developing countries have offered various financial and fiscal incentives to induce FDI.

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[176] The word "area" is used since the geographical pattern of empirical studies is varied, ranging from a city to a country or a group of countries

Such efforts have intensified competition among developing countries for a higher share in world FDI flows The reason behind this competition is simple; it is believed that FDI promotes economic growth of host countries To assess this proposition the next chapter will review the literature about the impacts of FDI on the economic growth of developing countries

Table II.1 - Summary of the Main Empirical Findings on Host Countries' Location Advantages

Factors	Effects	Advanced countries	Developing Countries	Mix of developed and developing countries	ASEAN Countries
Domestic market size	Positive	Hood and Young (1983); Ray (1989); Bagchi-Sen and Wheeler (1989); Culem (1985, 1987); Cushman (1988); Barrel and Pain (1996); Pain (1997); Billington (1999)	Schneider and Frey (1985); Chen C. L. (1997); Urata and Kuwai (2000);	Kravis and Lipsey (1982); Wheeler and Mody (1992), Loree and Guisinger (1995)	Lucas (1993); Jackson and Markowski (1993); Goldar and Ishigami (1999)
	Insignificant		Root and Ahmed (1979)	Loree and Guisinger (1995).	
Growth rate of domestic market	Positive	Culem (1988); Billington (1999)	Root and Ahmed (1979); Schneider and Frey (1985), Tsai (1994), Chen C. L. (1997a);		Goldar and Ishigami (1999)
Export market	Positive		Singh and Jun (1995)	Dunning (1980)	Lucas (1993); Jackson and Markowski (1994)
Openness to trade	Positive				Goldar and Ishigami (1999)
	Insignificant		Chen C. L. (1997a)	Kravis and Lipsey (1982); Smarzynska and Wei (2000)	Goldar and Ishigami (1999)
Competitiveness in host countries	Negative	Milner and Pentecost (1996)			
	Positive				Jackson and Markowski (1994)
	Insignificant				Goldar and Ishigami (1999)
Economic integration	Positive	Thomsem and Nicolaides (1991); Balasubramanyam and Greenaway (1992); Almor and Hirsh (1995); Aarle (1996)	Blomstrom and Kokko (1997)		
	Insignificant	Blomstrom and Kokko (1997)			
Labour cost	Negative	Cushman (1987), Culem (1988); Aarle (1996)	Kirkpatrick and Yamin (1981); Schneider and Frey (1985); Lecraw (1991); Woodward and Rolfe (1993); London and Ross (1995); Chen C. L. (1997a); Liu et al. (1997); Dees (1998)	Wei (1997)	
	Insignificant			Wheeler and Mody (1992); Loree and Guisinger (1995)	

Factor	Effect			
Supply of skilled labour force	Positive	Culem (1988); Ernst and Young (1993); Dent and Randerson (1996); Milner and Pentecost (1996)	Grub et al. (1990); Dees (1998)	Chia (1999)
Unemployment[i]	Positive	Friedman et al. (1992); Billington (1999)		
Corporate tax rate	Significant	He (1991)	Mudambi (1995); Co (1997)	Shah and Slemrod (1990); Grubert and Mutti (1991);
	Negative	Hines (1996); Billington (1999)	Mudambi (1995); Gastanaga et al. (1998)	Loree and Guisinger (1995); Wei (1997); Wei (2000)
	Insignificant		Smarzynska and Wei (2000)	Wheeler and Mody (1992); Ernst & Young (1994); Jetro (1995); Fortune/Deloitte & Touche (1997)
Tax incentives	Positive	Dent and Randerson (1996)	Chen C. L. (1997c); Woodward and Rolfe (1993)	Bond and Samuelson (1986); Grubert and Mutti (1991);
	Little effect		Chen C. L. (1997c)	Wheeler and Mody (1992); Ernst and Young (1994); Oman (2000)
Good infrastructure	Positive	Dunning and Norman (1979); Ernst and Young (1993); Christodolous (1996)	Root and Ahmed (1979); Lecraw (1991); Woodward and Rolfe (1993)	Urata and Kawai (2000)
Favourable policies toward FDI	Positive	Yuill et al. (1994); Dent and Randerson (1996)	Lecraw (1991); Fukaska et al. (1994); Nunnenkamp (1997); Chen C. L. (1997c); Gastanage et al. (1998); OECD (2000)	Hill and Athukurula (1998); Chia (1999)
	Insignificant		Mudambi (1995)	Wheeler and Mody (1992)
Incentives	Positive	Mc Connell (1980)[iii]; Arpan (1981)[*]; Hill and Munday (1992, 1994)[*]; Taylor (1993)[*]; Yuill et al. (1994)[*]		
	Little evidence			

Political Stability	Positive	Root and Ahmed (1979); Schneider and Frey (1985); London and Ross (1995); Woodward and Rolfe (1993); Singh and Jun (1995)	Loree and Guisinger (1995); Wei (1997)
Country Risk[iii]	Negative Insignificant	Lecraw (1991); Modambi (1995)	Shah and Slemrod (1990) Wheeler and Mody (1992); Chen and Chen (1998)
Agglomeration economic effects	Positive	Arpan (1981); Ray (1989); Bagchi-Sen and Wheeler (1989); Dent and Randerson (1996); O'huallachain and Reid (1996); O'huallachain (1996)	Wheeler and Mody (1992)
Self-perpetuating effects	Positive	Singh and Jun (1995); Head and Ries (1996); Chen C. L. (1997a, b*); Cheng and Kwan (2000)	Wheeler and Mody (1992); Mody and Srinivasan (1996); Jackson and Markowski (1994)

[i] This variable is used a proxy for the availability of labour force.

[ii] Studies on intra-country FDI inflows

[iii] This variable may consider both political risk and business risk.

Chapter III - Impacts of Foreign Direct Investment on Economic Growth of Developing Countries: A Review

Introduction

This chapter reviews the existing literature about the impacts of FDI on the economic growth of developing countries Although for the last few decades the hostility towards FDI has decreased substantially and FDI liberalisation has been widely carried out based on the belief that FDI promotes higher economic growth, the literature about the impacts of FDI on economic growth conveys different points of view.

To date there have been very few attempts to review this literature[1]. The existing reviews normally consider various effects of FDI on host economies, including growth, balance of payments and technology. While dealing with the growth effects of FDI, these reviews concentrate on the contemporary literature, which employs the new growth theory as the theoretical framework This chapter will review contemporary literature and less contemporary theories, such as the dependency and modernisation theories Thus this chapter not only provides a more up-to-date review of literature, but also sketches the evolution of academic interests in the impacts of FDI on the economic growth of host developing countries

This chapter is structured as follows Section 1 discusses theoretical propositions about the impacts of FDI on economic growth of host countries. On one hand, neo-classical, modernisation and new growth theories advocate the contribution of FDI to growth On the other hand, FDI is criticised mostly by the Post-Keynesian

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[1] For example, Blomstrom and Kokko (1996) review the impacts of foreign investment on host countries, Saggi (2000) surveys recent trade literature on international technology transfer, paying particular attention to the role of FDI on growth through technology transfer The review by De Mello (1997) is the only study that focuses on the growth impacts of FDI in developing countries but this review considers only studies based on the new growth theory

approach, the North-South and dependency theories as detrimental to host economies Some "compromising" arguments articulate that under some conditions FDI could promote growth. Section 2 discusses the methodologies employed by empirical research and reports evidence from cross-country and time-series analyses. We find that empirical results about the impacts of FDI on economic growth are *indeterminate*, *inconsistent* and *heterogeneous* across countries. In this section we also try to find out why the growth consequences of FDI vary across developing countries and to account for the reasons behind the inconsistency of empirical findings. Section 3 looks for evidence of FDI's contribution to technology accumulation Section 4 concludes the chapter.

1 – FDI and Economic Growth: Theoretical Outlook

A usual approach to conduct a literature review is to describe major theoretical arguments in a chronological order. This method is inappropriate for our survey because the arguments in this literature are based on different schools of thoughts in Economics that follow no particular chronological order, from the mainstream, i e neo-classical and new growth theory, to other heterodox schools such as post-Keynesian and dependency theories. In this section we categorise the theoretical literature on the effects of FDI on the economic growth of host developing countries into three groups. an optimistic perspective (FDI enhances economic growth), a pessimistic perspective (FDI does not enhance economic growth), and a conditionally-optimistic perspective (growth effects of FDI are conditional upon various prerequisites). All the three perspectives propose that FDI affects economic growth in host developing countries by influencing economic structure, capital accumulation and technological progress However, in each perspective, the consequences of such impacts vary. The optimistic perspective regards the effects of concentration and monopoly power exercised by FDI

on host economic structure as favourable and the capital, technology and skills brought about by FDI are beneficial for growth. The pessimistic perspective considers the impacts of FDI as detrimental for economic structure and growth. According to this perspective, FDI is exploitative, and creates structural distortion in host developing countries and technologies brought about by foreign firms are ill-suited for technological progress in developing countries The conditionally-optimistic perspective argues that the positive impacts of FDI on economic growth are conditional upon several factors relating to the characteristics of host developing countries and the sectoral pattern of FDI

1.1 - The Optimistic Perspective: FDI can be an Engine of Growth

1.1.1 - FDI has Positive Impacts on Economic Structure

The *unbalanced growth* model of Hirschman (1958) suggests that foreign capital promotes growth in two ways *First,* it creates industrial and/or geographical concentration that *"enable and embolden a country to set out on the path of unbalanced growth* (p. 205)" Foreign investment is preferable to domestic investment, particularly governments' investment, in creating such an *unbalanced environment* that spurs economic growth This is because, the state, a major investor in developing countries, is reluctant to concentrate its investment effort in a single region and, therefore, does not create such an environment It is, however, important to note that governments in developing countries in many cases prefer to invest in some certain areas and sectors, which may create unbalanced environments (for example, the South Korean government made huge investments in heavy industries between 1973-1979[2]) Therefore, Hirschman's argument seems to overemphasise the role of FDI *Second,* Hirschman suggests that foreign investment relieves the supply shortages that create inflation and balance of payments (BOP) deficits. If inflation is actually a result of

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[2] Collins (1990)

supply difficulties, a view that many economists would disagree with, the industrial

destinations of FDI, nevertheless, depend on various determinants. Supply shortages in

the host countries might or might not be one of these determinants and therefore the

role of FDI in solving the problem of supply shortages might not be as promising as

Hirschman argues [3].

The *modernisation* theorists suggest that FDI contributes to the economic

growth of developing countries in several ways. *First*, according to Rostow's (1960)

'stages of growth theory', FDI helps the process of economic growth in developing

countries by setting the stage for an economic takeoff. *Second*, FDI participates in the

modernisation process that helps to bridge the gap between developed and under-

developed nations (Lerner, 1958, Adelman and Morris, 1967, and Inkeles and Smith,

1974) *Finally*, economic dualism – the co-existence of an advanced-technology

foreign sector and a traditional-technology domestic sector – resulting from the

presence of FDI is viewed as an important stage that has a marked effect on the path of

economic growth (Adelman and Morris 1967).

More recently, the *liberal market approach*, campaigned by the World Bank

and the UNCTAD (The United Nations Conference on Trade and Development),

strongly advocates FDI as an "engine of growth"[4]. This view suggests that FDI

stimulates economic growth by providing access to export markets, contributing to a

structural shift in exports in favour of technologically advanced products, and fostering

technological progress FDI could also indirectly accelerate growth by encouraging the

development of domestic firms

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[3] See e g the eclectic investment theory of John Dunning (1973, 1980)

[4] Various issues of the World Development Reports have spread the belief that a freer market is the route
to higher economic growth, emphasising opening up of the economy to trade and foreign investment as
the keys to maximise economic growth The World Investment Reports by the UNCTAD are very much
in the same line as the World Development Reports For example, the title of the 1992 Report is
"Transnational Corporations as Engines of Growth"

1.1.2 - FDI Accumulates Capital

In the neo-classical and modernisation approaches, capital accumulation plays a significant role in economic growth, and capital scarcity is assumed to be a major obstacle in the growth process (see, e g Solow 1956; Rostow 1971; and UNCTAD, 1992). FDI is considered to have significant contributions to the capital accumulation process in developing countries First, FDI brings capital that is not available in the host developing countries Unlike other sources of foreign capital such as commercial debt or portfolio investment, FDI engages in long-term projects, and is more stable and easier to service (UNCTAD, 1992). *Second*, FDI accelerates the domestic capital accumulation process by (a) mobilising local savings, which would otherwise remain idle or be used in less productive activities (Lall and Streeten, 1977), and (b) stimulating domestic investment through competition and backward and/or forward linkages between foreign and domestic firms (Griffin, 1970; UNCTAD, 1992; and De Mello, 1999)

1.1.3 - FDI Accumulates Technology

According to Hirschman (1958), a major obstacle in the process of economic growth in developing countries is the lack of skills and abilities in order to channel savings into productive investment opportunities. FDI is needed for growth both *qua* capital and *qua* technology and skills Hirschman contends that "*when domestic savings are not the factor limiting development, foreign capital is needed not much qua capital as it brings certain abilities and skills that are in particularly short supply* (p 39)". This proposition that FDI promotes growth by bringing technologies and skills also receives support from the modernisation theorists The modernisation approach considers technology brought about by foreign investment as modern while technology undertaken by indigenous producers is considered as traditional FDI contributes to

growth because modern technology rather than traditional technology tends to promote

the modernisation process (Adelman and Morris 1967; and Inkles and Smith 1974).

The *new growth theory*, which emphasises the vital roles of knowledge and

technology in the economic growth process, is said to provide a conceptual framework

for analysing the impacts of FDI on growth (Balasubramanyam et al. 1996) According

to the new growth theorists, FDI has positive impacts on economic growth because it

contributes to the technological progress of developing countries (Findlay, 1978;

Wang, 1990, Blomstrom and Kokko, 1996; and Borensztein et al , 1998). *First*, FDI

brings advanced technology to developing countries. *Second*, the presence of

technologically advanced foreign firms leads to enhancement of the technological

levels of indigenous firms through 'technology spillover' and 'increased competition'.

Spillovers occur through backward and forward linkages between foreign and domestic

firms, and also when local firms learn by watching their foreign counterparts. Also,

workers in developing countries obtain new skills by working in foreign companies and

transfer these skills to domestic firms when they move to that sector. The increased

competition due to the presence of FDI forces local firms to use their resources more

efficiently and/or adopt new and more efficient technology to survive De Mello (1999)

argues that technology embodied in FDI may make use of existing old technologies

used by local firms, rather than eradicate such technologies.

Assume that technology transferred by FDI is suitable for technological

development and could promote growth in developing countries and also assume that

such technology is diffused to the domestic sector[5], a question put forwards is whether

developing countries are able to absorb new technology? We come back to Hirschman

(1958) with his argument that FDI enters the country to recognise the opportunities that

domestic entrepreneurship cannot realise due to lack of technology and skills In this

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[5] This issue will be discussed in detail in Section 1 2

early stage, FDI is needed *qua* capital but more importantly *qua* technology. Later when the "[domestic] *entrepreneurial and managerial abilities are there ... foreign investment is needed qua capital*" (p 39). By this Hirschman indicates that domestic and foreign entrepreneurial and managerial abilities would eventually become equal. The domestic abilities would improve as Hirschman suggests, if the following conditions were met (1) there is spillover of technology from the foreign sector to the domestic sector, (2) the level of domestic knowledge reaches some certain level in order to learn new technology; (3) overall domestic socio-infrastructure enables and encourages domestic abilities and skills to develop, and (4) foreign abilities and skills remain largely unchanged or progress at slow rates that enable domestic abilities to catch up. Various empirical studies, *infra*, suggest that not even one of the above conditions could be met easily by developing countries.

1.2 - The Pessimistic Perspective: FDI can have Detrimental Effects on Growth

1.2.1 - FDI Distorts the Host Economy

According to the pessimistic perspective, FDI creates distortion in host developing economies and creates obstacles to growth and development (Baran, 1957, Singer, 1971, Kalecki, 1976) FDI creates high industrial concentration in the host developing countries, which is likely to lead to a high degree of monopoly and/or oligopoly, distorting the domestic economy and reducing the rate of economic growth (Lall and Streeten, 1977, Bornschier, 1980). Kalecki (1976) contends that, with the inflows of FDI, the economy will be given '*a one-sided twist*' because FDI concentrates in certain industries that are not in line with the development plans of the country· Domestic capital, skills and resources, which could otherwise be directed to long-term growth promoting activities, are appropriated by foreign firms or by firms facilitating foreign companies (Baran, 1957)

High concentration is likely to lead to a high degree of *monopoly* and/or *oligopoly*, which distorts the domestic economy and reduces the rate of economic growth (Lall and Streeten, 1977, Bornschier, 1980). Such concentration also leads to *export bias* toward raw material and labour-intensive products (Helleiner, 1973). The practices of industrial monopoly brought by FDI and their mark-up pricing strategy could lead to problems of inflation in developing countries[6] (Kalecki, 1976)

The presence of FDI may *suppress domestic entrepreneurship* due to its detrimental effects on the profitability and growth of domestic firms While the advocates for FDI argue that high competition created by FDI forces domestic firms to be more efficient, the dependency theorists fear that domestic firms may be driven out of business due to high competition, lack of capital and investment opportunities, all due to the penetration of FDI (Lall and Streeten, 1977; Lall, 1978).

In a *Post-Keynesian approach*, the balance of payment constraint growth model of Thirlwall (1982, 2000) suggests that though FDI may be used to finance current account deficits for the country to achieve higher growth, a long-term solution for developing countries is a structural change in production and exports toward more value-added and skill-intensive outputs This argument might have originated from Thirlwall's observation that foreign capital is less important for the growth of advanced countries and also less important for developing countries with a high share of manufacturing exports than for other developing countries An increase in FDI might not be favourable, because FDI can cause problems relating to the nature of the goods produced and the techniques of production employed, and thus prevent structural change

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[6] Kalecki (1976) also shows that FDI may not be a solution for the balance of payments deficit and its impacts "must be negative" unless the flow of foreign investment grows substantially from year to year These discussions of Kalecki about the impacts of foreign investment on inflation, balance of payment deficits and in general, growth of developing countries are in contrast with the propositions of Hirschman (1958)

1.2.2 - FDI Does Not Accumulate Capital

The pessimistic perspective views FDI as 'capital exploitative' rather than 'capital accumulative' (Baran 1957; Kalecki 1976, and Lall and Streeten 1977). *First*, it is argued that FDI itself does not bring in as much capital as it seems. This is because. (a) the amount of capital that FDI brings in could be exaggerated due to the transfer pricing practice, especially when a large part of FDI is in the form of imported machinery and intangibles, which is difficult to be valued (Lall and Streeten, 1977), and (b) huge capital outflows in the form of profit repatriation make the net inflows of FDI rather trivial and much smaller than commonly proposed by the advocates of FDI (Baran, 1957; Dos Santos, 1970, Chase-Dunn, 1975)[7]. *Second*, FDI could 'decapitalise' the domestic capital accumulation and thus hinder economic growth in developing countries in the long-term (Frank, 1969, Chase-Dunn, 1975; Bornschier et al., 1978, and Bornschier, 1980) Decapitalisation, or the loss of capital for accumulation, occur because: (a) the concentration of FDI might divert investment previously available for domestic firms to foreign firms or to domestic firms in the industries that facilitate foreign investment, thus reducingcapital formation in some sectors and regions, and (b) foreign firms increasingly borrow in the domestic market and thus crowd domestic entrepreneurs out of their own domestic capital market (Harrison et al., 2001). Domestic enterprises then would be easily driven out of business because of high competition, lack of capital and investment opportunities, all due to the penetration of foreign firms. Capital formation in some sectors and regions would be higher but in the long-run the overall capital accumulation of the domestic sector might deteriorate, slowing economic growth in host countries

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[7] Reinvestment, rather than profit repatriation, however could mean more foreign dependence and more economic distortion (Baran, 1957)

1.2.3 -FDI Does Not Accumulate Technology

The pessimistic perspective suggests that developing countries pay too high a price for technology transferred by FDI, in particular, the monopoly practices that usually come with the technology adversely affect the host economies. Such high-price technology however is often suited only to advanced countries rather than developing countries and it is transferred without any transformation for the very different economic and social conditions in developing countries (see e g Hymer, 1966, Lall and Streeten, 1977) According to Dos Santos (1970) increases in FDI could create 'technological-dependence' on foreign capital This dependence makes industrial development in developing countries strongly conditional upon the FDI's technological monopoly The domestic industrial and technological structure, therefore, responds more closely to the interests of foreign firms than to the internal development needs Dutt (1997) argues that if labour and other resources concentrate in producing simple goods for foreign firms and therefore are drawn away from science-based and other technology-intensive industries, the development of technological capabilities in developing countries will be hampered. Domestic technological capacity may also be distorted because the advanced technology embedded in FDI tends to replace the existing technology used by domestic firms (Lall and Streeten, 1977 and *cf* De Mello, 1999)

In assessing the technological impacts of FDI in terms of transfer and spillover it might be useful to see whether foreign firms wish domestic firms to progress technologically. According to the eclectic theory of international production of John Dunning (1973) technology is an important firm-specific advantage that influences multinational corporations' decisions to invest in the form of FDI It would be in the interest of FDI firms to protect rather than to share such advantages with domestic

firms because an increase in domestic relative efficiency is unfavourable to continuing FDI penetration (Findlay, 1978).

1.3 - The Conditional Perspective: Impact of FDI on Economic Growth is Conditional

The growth effects of FDI in this strand are theorised as positive but conditional upon some factors of host countries, rather than absolutely positive or negative (*supra*). The conditions can be broadly categorised into two groups: (1) factors relating to host countries and (2) factors relating to the sectoral pattern of FDI. Regarding host countries' characteristics, Adelman and Morris (1967) argue that socio-political stability in host countries is required for FDI to participate in the modernisation process. Kalecki (1976) also believes that the implementation of certain policies – such as policies to prevent the practices of transfer pricing and monopoly/oligopoly by FDI firms – is required to make FDI inflows work for host developing countries. He, however, doubts that the implementation of such policies could create an environment to attract FDI.

The study by MacDougall (1960) has been considered as a classic and pioneering analysis of the effects of FDI on host countries. It is quite common to find studies that quote '*investment by foreigners is conceived of as a marginal addition to this stock of capital* [of host countries]' (e g Findlay, 1978, p. 6) as a proposition attributed to MacDougall. But in his paper MacDougall also stresses that FDI could have negative impacts on the growth of host countries if there is a lack of efficient government policies to prevent decreases in domestic investment due to increases in FDI. Nevertheless, his doubts regarding the impact of FDI on economic growth and on domestic capital accumulation are largely neglected

Findlay (1978) hypothesises that the rate of technological progress in a relatively backward region is an increasing function of the gap between its own level of

technological level and that of the advanced region, and the degree to which it is open to FDI That is, the more technologically backward a country is, and the more FDI that it receives, the higher the technological progress rate it experiences Nonetheless, Findlay recognises that the disparity must not be too wide for the hypothesis to hold, and that the educational level of the domestic labour force influences the domestic rate of technical progress in a positive direction Similarly, Borensztein et al. (1998) argue that although FDI brings such technologies and thus can contribute to the economic growth of developing countries, the implementation of these more advanced technologies requires the presence of a sufficient level of human capital in host economy. Like Findlay (1978) and Borensztein et al (1998), Hermes and Lensink (2000) perceive that the growth rate of developing economies is highly dependent on the extent to which these countries can adopt and implement new technologies They also agree that the main contribution of FDI is to the technological progress of host countries Besides from human capital endowment, Hermes and Lensink argue that another crucial characteristic of the environment in a host country needed to maximise the technological contribution of FDI is the development of the domestic financial system Some certain level of financial system development is needed to mobilise savings, encourage more efficient investment and overall enable domestic firms to realise their investment plans when they need to invest to upgrade their own technology or adopt new technologies, so as to gain more from FDI spillover

Balasubramanyam et al. (1996) argue that for FDI to be a potent factor in promoting growth, a conducive economic climate is required In the absence of such, FDI may be counterproductive An import-substituting policy tends to create a distorted climate, and under this policy FDI may enhance the private rate of return but is unlikely to exert an impact on social rate of return of investment Meanwhile an export-

promoting policy promotes free play of market forces and competition and provides an ideal climate for FDI to promote growth

Although much has been written on what developing countries should do or possess in order to benefit from FDI, little effort has gone into investigating which types of FDI developing countries would benefit from the most. It is plausible to expect FDI in textiles and garments, for example, to have different growth impacts than FDI in the electronics industry The North-South model of Dutt (1997), among very few, suggests that the *sectoral pattern* of FDI is also an important determinant of the growth consequences of FDI. Dutt argues that FDI into sectors competing with products made in developed countries, such as manufacturing and value-added products are likely to have more positive effects than FDI into sectors competing with products made in developing countries *Export-oriented* FDI might alter the export structure and increase the export volume of host countries. Production of export-oriented FDI firms might require high levels of technology and management due to high competition and demand for high-quality products in foreign markets It is thus argued that export-oriented FDI could have more favourable growth effects than FDI that targets protected domestic markets (see e g. UNCTAD, 1992)

1.4 - Some Suggestions for Future Research

The above review of theoretical arguments regarding the impacts of FDI on the economic growth of developing countries seems to provide no solid conclusions. Although these arguments come from different theoretical backgrounds, i e. different assumptions and analytical frameworks, a common feature is the aggregated approach towards FDI Most studies consider FDI as a homogeneous phenomenon, i e FDI is generally referred to as investments made by foreign investors to acquire a lasting interest in an enterprise operating in host countries[8]. Meanwhile FDI is comprised of

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[8] World Development Report (World Bank, 1995)

various investments made by various multinational corporations in various industries and at various scales For a more systematic assessment of the growth impacts of FDI, a disaggregated approach should be considered to differentiate the growth impacts of (1) different types of FDI, and (2) different volumes of FDI. FDI in different industries with different technology levels could have different impacts on economic structure, terms of trade and technological development in host countries For example FDI in value-added and skill-intensive manufacturing production could have higher impacts on labour skills than FDI in labour-intensive production The growth impacts of different types of FDI therefore should be differentiated. Another important issue, which has largely been ignored by the literature, is the amount of FDI, which could be vital in determining the impacts on economic growth of FDI The growth impacts of FDI could be substantially different between countries that are highly dependent on FDI, i e countries with a high ratio of FDI to total investment, and countries where that ratio is trivial

2 - FDI and Economic Growth: Empirical Outlook

Empirical literature on FDI, like empirical literature on any other social phenomenon, faces two problems· expressing theories in such a way that it has an empirical counterpart, and expressing different theories in such a way that the data allow us to discriminate between themselves. The solution for these two problems is not straightforward because *"[T]he finer points of theories which differentiate them at the theoretical level may not have an empirical counterpart which allow them to be differentiated at the empirical level"* (Dow 2002, p 39)[9]. Although Section 1 suggests that there is scope for different theoretical treatments of the growth effects of FDI on

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[9] For example, although the theoretical discrimination between neo-classical growth theory and endogenous growth theory is based on enodogeniety and exogeniety of technological progress, empirical tests of these two theories are based on similar econometric equations

host developing countries, the empirical studies in our review are not always clear-cut about which theories they are descended from.

In this study, we report econometric evidence from studies that include the FDI variable as an explanatory variable in the growth function. Our survey of empirical studies is based on a search that uses three popular electronic databases archives: JSTOR, ScienceDirect and Web of Science The criterion for studies to be included in this review include 1) the study assesses impacts of FDI on economic growth; 2) the study uses quantitative methods, and 3) the study considers developing countries only, i.e studies that have developed countries in the study sample are excluded from the review The phrases "foreign (direct) investment", "economic growth" and "developing countries" are used as key words for searching. The search returns 18 cross-country and 6 single-country studies that use quantitative methods to assess the impact of FDI on economic growth in developing countries Empirical studies that consider both developed and developing countries are not included in this review All of them were published after 1970[10].

We divide the studies into two groups (a) studies published in the 1970s and 1980s, and (b) studies published since 1990 Generally speaking, studies in the first group are concerned more with the capital accumulation effect of FDI[11] and estimate the growth contributions of different kinds of investment, e g. domestic investment, foreign aid and FDI On the other hand, most of studies in the second group employ the framework of the new growth theory and concentrate on the impact of FDI on growth through technological spillovers. Although the results of the studies published since 1990 seem to be more optimistic about the growth effects of FDI than studies of the

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[10] There are some earlier studies that estimate the growth impacts of foreign capital, which is the sum of foreign aid, foreign direct investment and long-term borrowings These studies do not meet our requirement, and therefore are not included in our list

[11] This does not indicate that studies in the 1970s and 1980s completely desert the technology pattern of FDI

previous period, our review suggests that findings of empirical studies are indeterminate, inconsistent and heterogeneous across space and time.

Overall the empirical literature seems to neglect the notion that the volumes and patterns of FDI vary extensively across countries and thus the growth consequences of different volumes and patterns FDI could be different. It seems that FDI is "good" in some countries because those countries possess some prerequisites such as human capital, government policies and institutions And it is "bad" in some other countries, which do not meet or possess those conditions. The existing literature pays little attention to the different impacts of different kinds of FDI. It is reasonable to expect minor technological gains for host countries if FDI is concentrated in unskilled labour-intensive industries Approximated measures of the impact on growth of all types of FDI, used in almost all empirical studies, might under-estimate the impacts of some types of FDI and, at the same time, over-estimate some others[12]. Empirical studies also tend to neglect the scale effect in accounting for the impacts of FDI on growth If empirical studies for countries that have low ratios of FDI to total investment report a relatively large coefficient of FDI, it could be misleading to interpret FDI as having an important role in explaining variations in growth performance of those countries.

2.1 - Research Methodologies

2.1.1 - The Growth Accounting Framework

The most frequently used methodology in empirical studies for the growth effects of FDI is growth accounting[13] This approach is derived from the basic Cobb-Douglas production function, and decomposes the growth of output into growth of inputs and the productivity level

$$Y=A(K, L) \hspace{4cm} (3\ 1)$$

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[12] The study by Dutt (1997), which estimates the impacts of FDI in primary, secondary and tertiary industries, is an exception

[13] Solow (1957) and Denison (1962, 1967)

where Y is output, K is capital, L is labour and A is technological level. Taking logarithms and time derivatives of this augmented Cobb-Douglas function yields the equation:

$$g_Y = g_A + \zeta g_K + \psi g_L \qquad (3.2)$$

where g is the growth rate of A, K, L, and ζ, ψ are the elasticities of output with respect to capital and labour[14]

Considering FDI as an additional input in the production function, the growth accounting equation becomes

$$g_Y = g_A + \zeta g_K + \psi g_L + \gamma g_F \qquad (3.3)$$

where γ is the elasticity of output with respect to FDI.

The studies during the 1970s and 1980s tended to conduct a partial analysis of economic growth That is, these studies measured the impacts of different components of capital on growth while factors other than capital were usually neglected[15] In these studies, the size, sign and significance of coefficients of the FDI variable (and other variables representing capital) are only indicative The studies during 1990s take into account the contributions of different factors other than capital and FDI such as labour and exports Many studies assume that FDI contributes to *Total Factor Productivity* (TFP) Coefficients of the FDI variable are used to measure the increase in output growth due to increase in FDI

Although the growth accounting approach is popular, it faces some problems and does not constitute a theory of growth. This methodology does not attempt to explain how changes in inputs and improvements in TFP relate to elements – such as aspects of preferences, technology, government policies – that can reasonably be viewed as fundamentals[16]

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[14] For details of growth accounting derivations see Barro and Sala-I-Martin (1995)
[15] For example Papanek (1973) and Stoneman (1975)
[16] See Barro and Sala-I-Martin (1995) and de Mello (1997)

2.1.2 -The Causality Analysis

As compared with growth accounting, the application of causality analysis is more recent (Zhang 2001, Nair-Reichert and Weinhold, 2001 and Oliva and Rivera-Batiz, 2002) Most studies use the Granger causality test to detect the existence and direction of causality between FDI and economic growth. The Granger causality test is, however, unable to measure the sign and magnitude of such relationship

2.1.3 – Indicators of FDI and Datasets

In most studies FDI appears in the currency form as either stocks, or inflows or both[17]. FDI in monetary term is criticised as a crude measure; being unable to reflect real FDI activities in host countries (see e g Blomstrom et al., 1994) Many studies carry out comparative cross-country analyses with cross-sectional or panel datasets. Time-series analysis for a single country is less popular because macroeconomic variables normally have a limited number of observations over time and the degrees of freedom therefore could be reduced significantly

2.2 - Studies Published in the 1970s and 1980s

2.2.1- Main Features of the Studies

Most empirical studies in 1970s and 1980s are based on the framework of either the neo-classical or modernisation or dependency theories As mentioned earlier, these studies focus on the contributions to growth of different sources of capital, namely domestic savings, foreign aid and FDI. The growth effects of FDI are normally compared with those of domestic investment and foreign aid. The neo-classical and modernisation theories hypothesise that the inflows of foreign capital contribute to economic growth by bringing capital and enhancing domestic savings and investment The dependency approach hypothesises that although inflows of FDI could have immediate positive impacts on growth by bringing capital as in neo-classical theory, the

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[17] The dependency theorists include both stock and inflows of FDI in the regression to test for its long-run and short-run effect, respectively

stock of FDI on the contrary might have deleterious impacts due to decapitalisation (Section 1 2 2) Most studies are cross-country, and use averaged data for a certain period of time. Some studies estimate the impacts of foreign private investment, which is FDI plus other capital inflows such as long-term borrowings. These studies, therefore, do disaggregate the growth impacts of FDI from those of foreign private investment.

2.2.2 - Main Findings of the Studies

Table III 1 summarises results of the surveyed studies Papanek (1973), Bornschier (1980) and Rana and Dowling (1988) find that the effect of *FDI inflows* on growth is positive and statistically significant. It should be noted, however, that Papanek (1973) and Rana and Dowling (1988) estimate foreign private investment, which constitutes FDI plus long-term borrowings. The effect of FDI, separate from borrowings, is therefore not clear in these studies. Stoneman (1975), Bornschier et al. (1978) and Gupta and Islam (1983) find the effect of FDI inflows on economic growth positive but usually statistically insignificant

Table III.1 - Cross-Country Studies on the Growth Impacts of FDI, published in 1970s and 1980s

	Study sample	Growth impacts of FDI inflows	Growth impacts of FDI stock	Comparison with impacts of foreign aid	Comparison with impacts of domestic savings
Papanek (1973)	34 DCs[a] (1950s) and 51 LDCs (1960s)	(+) Significant		Lower	
Stoneman (1975)	47 DCs (1950s) and 71 DCs (1960s)	(+) Insignificant	(-) Significant	Lower	Lower
Borsnchier et al (1978)	76 DCs (1960-1975)	(+) Insignificant	(-) Significant		
Borsnchier (1980)	75 DCs (1965-1975)	(+) Significant	(-) Significant		
Gupta and Islam (1983)	52 DCs (1950-1960) and (1965-1973)	(+) Insignificant		Lower	Lower
Rana and Dowling (1988)	9 Asian developing countries (1965-1982)	(+) Significant		Higher	Lower

[a] DCs stands for developing countries

The effect of *FDI stock* on growth is generally reported with statistically significant but negative coefficients (Stoneman, 1975, Bornschier et al. 1978 and Bornschier, 1980). These findings that FDI could have positive impacts on growth in the short-term (estimated by effects of FDI inflows) and negative impacts in the long-term (estimated by effects of FDI stock) seem to be consistent with the hypotheses of the dependency theory[18].

In many cases, the coefficients of foreign aid flows are substantially higher than those of FDI inflows, suggesting that foreign aid is more efficient in promoting growth (Papanek, 1973; Stoneman, 1975 and Gupta and Islam, 1983). Rana and Dowling (1988) however find that in Asian developing economies during 1965-1982 foreign private investment, i e. FDI plus long-term borrowings, has more significant and favourable effects on growth than foreign aid because the former improves investment efficiency while the latter tends to reduce efficiency Some studies find that the contribution of foreign investment to growth is lower than that of domestic savings (Stoneman, 1975 and Gupta and Islam, 1983) Gupta and Islam (1983) suggest that developing countries should try to accumulate capital from their internal sources rather from outside

2.3 - Studies published since 1990

2.3.1 - Main Features of the Studies

Unlike the studies of the previous period, studies published since 1990 try to estimate the contribution to economic growth of both capital and factors other than capital – e g. labour and exports Most studies in this group adopt the new growth theory as their theoretical backbone Models and hypothesises are built on a general agreement that FDI may accelerate economic growth through technological spillovers rather than through mere capital accumulation. Along with the cross-sectional datasets,

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[18] This is also consistent with the conclusion of Bornschier et al (1978), which reviews studies published in 1970s on the effects of FDI and aid on growth and income inequality

theses studies use cross-country panel datasets to enlarge the number of observations. There are also some single-country studies that employ time-series data Findings of comparative cross-country studies seem to be ambiguous. Meanwhile findings and conclusions of single-country analyses show a higher level of consensus. Overall, empirical findings about the growth impacts of FDI are indeterminate and heterogeneous across countries and across studies. The empirical findings seem to be sensitive to technical issues such as the datasets employed and/or the proxy used in the estimation process.

2.3.2 - Evidence from Cross-country Studies

Table III 2 and III 3 summarise the findings of studies published since 1990 Almost half of the reviewed studies show that the impacts of FDI on growth are either insignificant or significant but negative. Tsai (1994), the only paper in this group testing for the hypothesis of the modernisation and the dependency theory, finds that neither FDI inflows nor FDI stock have significant and positive effects on growth of developing countries. Impacts of FDI stock on growth are found to be insignificant, or significant but negative, in 58 developing countries (Dutt, 1997) and in Arab countries (Sadik and Bolbol, 2001)[19].

Table III.2 shows that the effects of FDI on growth are significantly positive for large groups of developing countries in studies of Blomstrom et al. (1994), Balasubramanyam et al (1996, 1999), Oliva and Rivera-Batiz (2002). Campos and Kinoshita (2002) find significant and positive impacts of FDI on the growth of 25 transition economies in Europe in 1990-1998 These studies suggest that FDI positively influences growth by bringing advanced technology into host countries and by transferring this technological know-how to indigenous sectors Contrary to the studies published in the 1970s and 1980s, studies since 1990 generally find FDI to have higher

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[19] Sadik and Bolbol (2001) suggest that though FDI contributes to growth and investment in Arab countries, technological spillovers associated with it are still to be witnessed

effects on growth than domestic investment (Blomstrom et al., 1994; Bozenstein et al., 1998; Balasubramanyam et al., 1996, 1999; Oliva and Rivera-Batiz, 2002).

Table III.2 - Cross-Country Studies on the Growth Impacts of FDI, published since 1990 (I)

Study	Time	Countries	FDI	Coeff. of FDI
Dutt (1997)	1985-94	58 DCs	Stock	(-) Significant
Tsai (1994)	1975-78	62 DCs	Stock & inflows	*Insignificant*
	1983-86	51 DCs		
Sadik and Bolbol (2001)	1978-98	Oman, Morocco, Jordan	Stock	*Insignificant*
		Saudi Arabia, Tunisia, Egypt	Stock	(-) *Significant*
Bozenstein et al. (1998)	1970-89	69 DCs	Inflows	(+) *Insignificant*
Hermes and Lensink (2000)	1970-95	69 RCs	Inflows	(+) *Insignificant*
Blomstrom et al. (1994)	1960-85	78 DCs	Inflows	(+) Significant
		Higher-income DCs	Inflows	(+) Significant
		Lower-income DCs	Inflows	(+) *Insignificant*
Balasubramanyam et al. (1996)	1970-85	46 DCs	Inflows	(+) Significant
		Export-promoting DCs	Inflows	(+) Significant
		Import-substituting DCs	Inflows	(+) *Insignificant*
Balasubramanyam et al. (1999)	1970-85	46 DCs	Inflows	(+) Significant
De Mello (1999)	1970-90	15 OECD countries and 17 non-OECD countries	Stock	(+) Significant
Oliva and Rivera-Batiz (2002)	1970-94	119 DCs	Inflows	(+) Significant
Campos and Kinoshita (2002)	1990-98	25 Central and Eastern European countries	Stock	(+) Significant

Table III.3 summarises the results of studies that use the interaction term which was introduced by Borensztein et al. (1998) to empirically estimate the growth effects of FDI. They propose that without controlling for some additional variables – human capital in the host countries, for instance – it is difficult to discern the growth effects of FDI. The impacts of FDI on growth should be estimated through an 'interaction term', which is calculated by multiplying the level of FDI inflows with the level of human capital available in the host country. They find that the coefficient of FDI inflows is insignificant and that of the interaction is significant and positive. Similarly, Hermes

and Lensink (2001) find that FDI contributes to growth through its interactions with human capital and with financial market development in the host country.

Table III.3 - Cross-Country Studies on the Growth Impacts of FDI, published since 1990 (II)

Study	Coeff. of FDI	Coeff. of the interaction term	Condition under which FDI has a positive effect on growth of host countries
Bozenstein et al. (1998)	(-) Significant	(+) Significant	A threshold of human capital, i.e. a male population above 25 year-old with an average of 6 month of secondary schooling
Hermes and Lensink (2000)	(-) Significant	(+) Significant	A threshold of human capital and financial market development, i.e. a secondary school enrolment rate of above 7.4% and a ratio of private credit to GDP of above 12%
Balasubramanyam et al. (1999)	Insignificant	Insignificant	A threshold of human capital andeExport-promoting strategy
Campos and Kinoshita (2002)	(+) Significant	Insignificant	

2.3.3 - FDI has Positive Growth Impacts in Only Some Countries

The 'conditionally-optimistic' perspective (Section 1.3) suggests that host country characteristics could affect the potential benefits that a country may gain from FDI. The theoretical literature tends to consider various aspects, such as economic and political stability, government policies, and so forth, as host-country-determinants of the growth effects of FDI. The empirics, however, seem to concentrate on very few factors. Each empirical study tends to suggest one or two domestic prerequisites that are, in the uthor's view, necessary for FDI to contribute to economic growth. These findings imply that benefits of FDI are limited to only few countries that posses certain prerequisites.

Blomstrom et al. (1994) find that FDI exerts positive and significant impacts on the growth of higher-income developing countries but has insignificant effects on the growth of lower-income developing countries (Table III.2). They suggest that host countries need to reach *a certain level of development* to absorb new technology and to

benefit from FDI. In other words, there is *a threshold level of income* below which FDI has no significant effect, and the host country needs to reach that threshold level in order to benefit from FDI[20].

Balasubramanyam et al. (1996, 1999) find that FDI is a potent driving force in the growth process of export-promoting countries and exhibits no significant influence on growth in import-substituting countries (Table III.2). In this study, they argue that the implementation of *export-promoting strategies* would provide a favourable economic climate, allowing FDI to contribute to growth.

Bozensztein et al. (1998) and Hermes and Lensink (2000) strongly advocate the role of *human capital development* as a vital prerequisite for FDI to contribute to growth, especially through technology transfer and spillover[21]. They conclude that the positive growth effects of FDI materialise only if the host country has a minimum threshold stock of human capital (Table 3.3).

Hermes and Lensink (2000) argue that *the development of the domestic financial system* is a crucial requirement for FDI to have a positive influence on economic growth through technology transfer and spillover. They find that a country should have a ratio of bank loans to the private sector over GDP of larger than 12% for FDI to have a positive effect on growth (Table III.3).

Oliva and Rivera-Batiz (2002) suggest that *institution quality* is of substantial importance in attracting FDI and in creating a favourable environment for FDI to contribute to growth. They find evidence that institutions, proxied by democracy and rule of law, matter in making FDI favourable for growth.

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[20] Tsai (1994) however finds that the stage of development seems not to affect either the short-term or long-term impacts of FDI on growth.

[21] See Lucas (1988) and Romer (1987) for further discussion about the role of human capital in economic growth.

2.3.4 - Empirical Findings are Inconsistent

There are at least three sets of arguments that the results of the comparative cross-country analyses reviewed so far are inconsistent regarding the growth impacts of FDI. *First*, studies, which use similar samples of countries over similar periods of time, and which derive from the same theoretical background, could come to very different results. This can easily be seen when we compare studies of Borensztein et al. (1998) with Balasubramanyam et al. (1996, 1999); and studies of Hermes and Lensink (2000) with Oliva and Rivera-Batiz (2002). *Second*, Balasubramanyam et al. (1999) and Campos and Kinoshita (2002) find inconsistent results with those of Borensztein et al. (1998) and Hermes and Lensink (2000) when they repeat the same interaction exercise (see Table III.3). *Third*, Borensztein et al. (1998) suggest that all countries with the secondary school attainment of an adult of above half a year will benefit positively from FDI and that 46 out of 69 countries in their sample satisfy this threshold in 1980. Nevertheless, we find that more than three fourths of countries in the study of Tsai (1994) also satisfy this threshold requirement in 1970s and 1980s, but Tsai finds insignificant effects of FDI on growth[22]. In the sample that Sadik and Bolbol (2001) study, the ratios of secondary school attainment of Egypt, Tunisia and Jordan are also much higher than this threshold. Yet they find insignificant impacts of FDI on economic growth[23].

2.3.5 - Why are Empirical Findings Inconsistent?

Generally speaking, technical problems such as data sources, estimation methods and differences in the explanatory variables included could be the cause for the inconsistent and ambiguous findings. Empirical studies have used various sources of data, which are derived from different collecting methods, and could make data for one indicator highly inconsistent. The quality of data, especially of developing

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[22] We make the comparison with the same variable and data set that Borensztein et al. (1998) use, i.e. the "average years of secondary schooling in the male population" from the Barro-Lee dataset.

countries is also a serious problem. Inconsistency across studies might also be due to the use of different proxies for a variable. Proxies for FDI, particularly, are of importance. If a study uses the FDI annual inflows, it might estimate only the effects of FDI inflows of each year on growth rate of that year. Meanwhile, if the accumulated stock of FDI is used, not only the effects of FDI inflows in the year but also those of the existing level of FDI in the country will be estimated. FDI stock, therefore, might be a more appropriate proxy than FDI inflows.

Different estimation methods may also be the source of inconsistency. The use of panel or cross-sectional data analyses could lead to different findings. Panel data analysis has recently been praised over cross-sectional because the latter ignores changes over time[24]. However, because of problems of data availability, very few studies use panel-data analysis. If we look back at our comparison in section 2.3.4, a reason that the empirical findings are so different could be that Borensztein et al. (1998) use panel data analysis (average for 1970-79 and 1980-89) while Balasubramanyam et al. (1996, 1999) use annual average cross-sectional data. Similarly, Oliva and Rivera-Batiz (2002) employ panel data while Hermes and Lensink (2000) employ cross-sectional data. The variation of explanatory variables included in the regression could affect the sign, size and significance of the FDI coefficients. Borensztein et al. (1998), for example, control for such variables as government consumption and political instability while Balasubramanyam et al. (1996, 1999) are concerned with export growth.

The inconsistency of most cross-country studies reviewed might be due to the heterogeneity of growth impacts of FDI across countries. While the study of Oliva and Rivera-Batiz (2002) considers 119 developing countries, covering most of the countries in the study of Hermes and Lensink (2000), the former also includes the Eastern

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[23] Data are not available for the other three countries in the sample.
[24] For example De Mello (1999)

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European and former Soviet Union countries. The positive and significant effect of FDI in the overall sample of Oliva and Rivera-Batiz (2002) might be influenced by the highly positive effect of FDI in the sub-sample of transition European economies, reported by Campos and Kinoshita (2002). Heterogeneity across countries might be because of host country characteristics and the volume and pattern of FDI in each country (see also Dutt, 1997). It might be that FDI has negative impacts on economic growth in Arab countries (Sadik and Bolbol, 2001) but positive impacts in East European and former Soviet Union countries (Campos and Kinoshita, 2002) because: 1) FDI flows more rapidly to the transitional Eastern European countries; 2) Most FDI in Arab countries is in the primary and secondary sectors; while of FDI to the East European countries, on the contrary, more than 50% is in the tertiary sector and more than 40% is in the manufacturing sector; and 3) The transition economies are endowed with a well-developed source of human capital, while the Arab countries do not have cheap and skilled labour forces. In cross-country studies that neglect host countries' characteristics and the volume and pattern of FDI in each country, the effects of FDI seem to be averaged, i.e. the impacts of FDI could be under-estimated in some countries and over-estimated in some others. Findings from time-series analyses reviewed below seem to overcome this obstacle.

2.3.6 - Single-Country Analyses

Time-series analysis is not as popular as cross-country sectional or panel data analysis because most macroeconomic research for developing countries can trace annual data back only to the 1960s, leading to very limited number of observations. Some studies, e.g. those about China, try to enlarge the sample by using the provincial/regional data. Nevertheless there seems to be more consensus in the findings of single-country studies than those of cross-country analyses. Although most studies

suggest positive impacts of FDI, concern is raised about the long-term effects of FDI and the possibilities of adverse effects.

Studies on the impacts of FDI on the economic growth of China seem to agree that FDI promotes national economic growth, mainly through the diffusion of new ideas (Berthelemy and Demurger, 2000; Zhang, 2001 and Liu et al. 2002). FDI is also found to play a fundamental role in provincial economic growth in China (Berthelemy and Demurger, 2000 and Zhang, 2001). The huge amounts of FDI that have accumulated in China since the 1990s and that are concentrated in the coastal provinces seem to have exerted stronger positive effects in the 1990s than in the 1980s and in the coastal than the inland regions (Dees, 1998 and Zhang, 2001). Despite having the smallest share in total investment, FDI is found to be more efficient than domestic investment (Zhang, 2001 and Liu and Li, 2001).

A dynamic simulation for Thailand (Jansen, 1995) finds that FDI accelerates Thai economic growth through export growth and linkages - backward and forward - with local firms. Jansen estimates that the growth of GDP per annum in Thailand in 1986-1991 would have been on average 1.5 percentage points less than it was, i.e. 8.2% per annum rather than 9.7%, if FDI had not increased sharply in this period.

A study by King and Varadi (2002) on the impacts of FDI in the Hungarian economy seems to be more cautious than other single-country studies. Although their empirical evidence suggests that FDI has been very positive for the Hungarian economy, King and Varadi believe that FDI can take very different forms, with very different economic consequences. The benefits that foreign firms bring now might disappear over time if foreign firms succeed in establishing monopolies and therefore there exists the possibility that the current success of foreign-owned firms will lead to socially detrimental market concentration or even hinder future growth. This is in the line with the propositions of Kalecki and the dependency theory (see Section 1.2).

2.4 - What Comes First: Growth or FDI?

Although many studies presume that the relationship between FDI and growth starts from FDI, i.e., FDI influences growth; the flow of influence might also run from growth to FDI. Some studies call this the "endogeneity problem" and try some econometric techniques to solve the problem[25]. Some studies explicitly hypothesise the simultaneous relationship between FDI and growth[26]. Some studies employ causality analysis to examine the direction of the relationship between FDI and growth rather than measure the contribution of FDI to growth. Most studies apply the Granger causality analysis technique. This technique however is sensitive to the number of lags used in the analysis[27], i.e. the time periods for FDI to Granger-cause growth and vice versa.

Table III.4 summaries evidence from causality analyses. A Granger causal relationship from FDI to growth is found in cross-country analyses for developing countries (Blomstrom et al., 1994 and Nair-Reichert and Weinhold, 2001). Zhang (2001) also finds that FDI Granger-causes growth in Singapore, which he calls short-run causality. Zhang reports long-run causality from FDI to growth, estimated by the error correction model (ECM), in Mexico, Hong Kong, Indonesia and Taiwan. Nair-Reichert and Weinhold (2001) find that there is considerable heterogeneity across developing countries regarding the causality from FDI to growth and there is some evidence that the efficacy of FDI is higher in more open economies.

On the flow of direction from growth to FDI, Campos and Kinoshita (2002) report that growth does not Granger-cause FDI in transition economies between 1990-98. Meanwhile Zhang (2001) reports a short-run or Granger causality relationship from growth to FDI in Brazil, Korea, Malaysia and Thailand and a long-run or ECM causal

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[25] Borensztein et al., 1998 and Balasubramanyam et al., 1996 and 1999, for example, claim that this endogeneity problem can be avoided by the application of the instrumental variable techniques and find the results of the instrumental variable estimations similar to their original analysis.
[26] Tsai (1994)

relationship in Colombia, Mexico and Indonesia. The Granger causality analysis for 119 developing countries in 1970-94 conducted by Oliva and Rivera-Batiz (2002) reports inconclusive evidence about causality. However the association between FDI and growth becomes contemporaneous when the five-year averages, are used to attenuate the business cycle.

Table III.4 - Some Evidence from Causality Analyses

	Study sample	FDI causes Growth	Growth causes FDI
Blomstrom et al. (1994)	78 DCs (1960-1985)	Yes	
Zhang (2001)	7 East Asian and 4 Latin American countries (1950s-1997)	Short-run: Singapore Long-run: Mexico, Hong Kong, Indonesia, Taiwan	Short-run: Brazil, Korea, Malaysia, Thailand Long-run: Colombia, Mexico, Indonesia
Nair-Reichert and Weinhold (2001)	24 DCs (1971-1995)	Stronger in more open economies (heterogeneity across countries of this relationship)	
Campos and Kinoshita (2002)	25 transition economies (1990-1998)	No	
Oliva and Rivera-Batiz (2002)	119 DCs (1970-1994)	Inconclusive about causality but there is a contemporaneous association between GDI and growth when 5-year average is used.	

3 - FDI and Technological Benefits

Technology is normally regarded as the most crucial and also most difficult-to-attain benefit that developing countries wish to gain from FDI. The review of empirical studies in section 2 shows that most studies after 1990 assume that FDI promotes economic growth by contributing to technological progress. In this section, we look for evidence of technological benefits that developing countries receive from FDI.

First, we attempt to see whether foreign firms actually operate with higher productivity than domestic firms. We then try to find out whether technology brought by FDI improves the overall technology level of host countries. Secondly, we look for evidence on whether foreign firms extend their high productivity to their local partners

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[27] See Gujarati (1995).

and if there is spillover, whether the domestic technology level is enhanced or not. Most studies concentrate on the experience of one single country, normally using some distinctive sources of datasets such as manufacturing censuses by the industrial agencies. There is a general agreement in empirical findings that FDI helps to raise the technological level of host countries. The findings on spillover, however, are less conclusive. Quantitative studies tend to report that there is no spillover effect but qualitative studies often suggest some evidence of spillover. The literature mostly pays no attention to whether the technology that foreign firms bring is suitable for the technological conditions and the development process of developing countries.

3.1 - Does FDI Improve the Overall Productivity Level of the Country?

As multinational corporations are widely regarded as the source of advanced technology and such technology represents the firm-specific advantages that FDI brings with it to developing countries, it is not difficult to find evidence that foreign firms operate with higher productivity levels than their domestic counterparts. Blomstrom and Wolff (1994) find that foreign firms exhibit higher productivity than local firms in Mexico. Haddad and Harrison (1993) find that Moroccan firms with some foreign ownership exhibit higher levels of productivity than domestic firms. The study for Indonesia by Sjoholm (1999) reveals that foreign firms have higher productivity than domestic firms.

It is, however, not very clear from the empirical evidence whether the higher productivity of foreign firms, or more generally the presence of FDI, raises the overall productivity level of the country and of the recipient industry. Chen (1983) finds that there is a positive correlation between the rate of technical progress and FDI in Hong Kong. Foreign firms contribute to faster rates of technical progress in Hong Kong because they tend to spend proportionately more on R&D (if they undertake R&D) and play important roles in promoting the rates of diffusion to the local economy. The huge

amount of FDI that China has accumulated, especially since 1990, is said to help in closing more rapidly the 'idea-gap' and to improve Chinese productivity (Dees, 1998). FDI is found to be one of the most important factors enhancing the total factor productivity (TFP) of this country (see e.g. Dees, 1998; Liu and Wang, 2002) and in raising both the level and growth rate of productivity of manufacturing industries in the Shenzhen Special Economic Zone (Liu, 2002). Foreign presence in the Chinese electronics industry is also found to be associated with higher labour productivity in this industry (Liu et al., 2001). FDI firms in Mexico are said to speed up the productivity growth of the industries that they enter (Blomstrom and Wolff, 1994) as well as the rate of overall labour productivity growth (Ramirez, 2001). However FDI is found to exert a negative effect on TFP growth in Arab countries (Sadik and Bolbol, 2001). For Mexico, Brazil, Chile, Singapore and Zambia, FDI and technology efficiency are Granger-causality independent (Kholdy, 1995).

3.2 - Do Spillover Effects Exist? What are the Effects of FDI on Domestic Firms' Productivity?

Technology spillover from foreign firms to domestic firms could occur through demonstration, competition, training, worker mobility and local linkage[28]. The spillover effect could be *intra-industry*, i.e. FDI raises the technology level of domestic firms in the same industry, or *inter-industry*, i.e. FDI raises the technology level of domestic firms in other industries of the economy. Evidence from the empirical literature seems to indicate that domestic firms receive no (or even negative) spillover effects from foreign firms in the same industry. Evidence is found for the spillover effects, which occur through labour training and backward linkages from foreign to domestic firms, for the ancillary industries, i.e. domestic firms participate in the production chain.

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[28] See e.g. Blomstrom and Wolff (1994), Blomstrom and Kokko (1996)

Studies about spillover effects exhibit some shortcomings. The quantitative, i.e. econometric, studies generally test the hypothesis that the technological level of domestic industries increases with the presence of FDI. They cannot specify the channels through which spillover effects occur. The case studies, i.e. qualitative, are more successful in explaining whether and how such effects occur. Nevertheless these studies normally could focus on only a small number of firms in some industries, and therefore could not make a generalised conclusion about the spillover effects of FDI on the host economy.

3.2.1 - Intra-Industry Spillover Effects

There is some evidence that foreign firms raise the technology level of their domestic counterparts in the same industry. It is claimed that there are spillover effects from foreign to domestic firms in the manufacturing industries in Mexico (Blomstrom and Persson, 1983) and in Indonesia (Sjoholm, 1999) because domestic establishments in industries with a larger level of FDI have higher productivity growth than firms in industries with a lower FDI. Nevertheless it is very likely that foreign firms go to higher productive industries for the existing human and physical development in such industries and there might be simply no spillovers at all.

In the case of Mexico, Palacios (1995) finds that the electronic multinational corporations operating in Guadalajara, the site where most electronics firms locate, have transferred technology and know-how. Spillover effects take place in the form of in-house and on-the-job training in subsidiaries of multinational corporations. There is little transfer of *cutting-edge* technology due to the low absorptive capacity of local firms. The technological level of Mexican electronic firms remains low (Blomstrom and Wolff, 1994).

Li et al. (2001) find some evidence of spillover effects in the Chinese manufacturing sector although the extent to which such spillovers occur varies with

different types of ownership of local firms and of FDI. While collectively- and privately-owned enterprises benefit from demonstration and contagion effects from FDI, productivity gains of State-owned enterprises largely come from competition with foreign firms. Market-oriented FDI tends to generate spillovers mainly via competition with local firms. Using data on manufacturing industries in the Shenzhen Special Economic Zone of China, Liu (2002) find no industry-specific productivity gain associated with an increase in foreign equity participation in the industry itself.

Haddad and Harrison (1993) find no evidence that foreign presence accelerated productivity growth in domestic firms in the Moroccan manufacturing sector. They argue that this lack of spillover could be due to the technology gap between domestic and foreign-owned firms.

With data on Venezuelan industrial plants, Aitken and Harrison (1999) find that domestic plants in sectors with more foreign ownership are significantly less productive than those in sectors with a smaller foreign presence. They also find that increases in foreign investment negatively affect the productivity of domestic firms in the same industry. The gains from FDI appear to be entirely captured only by joint ventures, which benefit from positive spillover effects from FDI in the plant as well as from FDI in other plants within the same sector. Aitken and Harrison conclude that the sharp contrast of their findings with other studies, which find some spillover effects, is because "*If foreign investors gravitate towards more productive industries, then a specification which fails to control for differences across industries is likely to find a positive association between the share of DFI [sic] and the productivity of domestic plants even if no spillovers take place*".

3.2.2 - Inter-Industry Spillover Effects

There is some evidence that foreign firms raise the technology level of their domestic counterparts in the ancillary industry. Sjoholm (1999) reports inter-industry

spillover effects at province and district level in Indonesia. He points out that such positive spillover effects may result from local linkage industries. Liu (2002) finds that foreign investments in the Shenzhen Special Economic Zone of China facilitate inter-industry, rather than intra-industry, technology spillovers. There is a significant and positive relation between FDI in the manufacturing sector and both productivity and the rate of productivity growth of its component industries. Domestic sectors are the main beneficiaries of the large and significant spillover effects of FDI. State- and joint-owned sectors benefit more than other domestic sectors from the external effects of FDI.

Palacios (1995) finds that in Penang, Malaysia, foreign firms in the electronics industry have not only transferred technology but also stimulated the development of the ancillary industries. There are spillover effects such as in-house and on-the-job training in subsidiaries of multinational corporations. There are some collective actions between multinational corporations, local firms and government agencies to promote technological upgrading and human resources development through spillover. The findings from Palacios (1995) and Liu (2002) seem to suggest that the positive spillover effects of FDI to local firms are channelled through backward linkages, i.e. firms that become local suppliers of foreign firms could benefit from spillovers.

4 – Conclusion

This chapter reviews the theoretical and empirical literature about the impacts of FDI on economic growth. It shows that a variety of approaches have been used although there is not yet a concrete conclusion. Some studies suggest that FDI has positive impacts on economic growth, while other studies argue that FDI is detrimental to the process of economic growth in developing countries. Although the perceptions of these paradigms seem to be contradictory, they should be taken as complementary in

order to explain the variations in the impact of FDI on economic growth across countries.

Empirical studies are not more conclusive than theoretical arguments. This review shows that empirical findings about the impacts of FDI on economic growth are *indeterminate, inconsistent* and *heterogeneous* across countries. Some studies find that FDI promotes growth but some do not. Some studies suggest that FDI contributes to growth only if host countries meet some conditions such as human capital development and financial market development. Our review also shows that findings of the empirical literature are sensitive to data sources, estimation methods and the different explanatory variables included. There seems to be more consensus in time-series analyses about the impact of FDI on the growth of one country than there is in cross-country analyses.

Although the theoretical literature suggests different channels through which FDI can promote growth, empirical studies before 1990 tend to focus on the capital accumulation effect of FDI while studies after 1990 suggest that FDI contributes to growth mainly via technology progress. Nevertheless our review on this strand of the literature finds that there is not enough evidence about whether FDI contributes to technology progress. Though FDI firms are often found to operate with higher productivity, it is not very clear from the empirical evidence whether the higher productivity of foreign firms raises the overall productivity level of the country and the productivity level of the recipient industry. Evidence seems to indicate that domestic firms receive no (or even negative) spillover effects from foreign firms in the same industry. However some evidence is found for spillover effects, which occur through labour training and backward linkages from foreign to domestic firms in the ancillary industries.

The shortcoming of the literature about the impacts of FDI on economic growth is that FDI is largely considered as a homogeneous phenomenon. Consequently the

impacts of all FDI inflows, regardless of their characteristics, are simply considered as either 'good' or 'bad' or good in some countries that possess certain prerequisites. We call this '*the aggregated approach*' towards the impacts of FDI on growth. It seems that FDI in agriculture, light industry, heavy industry and commerce could have different impacts on growth. Impacts of manufacturing FDI for domestic sale could be different from those for export-oriented manufacturing FDI. Meanwhile little effort has gone into investigating which types of FDI would benefit developing countries the most. For a more systematic assessment of the growth impacts of FDI, a more '*disaggregated approach*' should be considered. That is, impacts on growth of FDI should be assessed according to: i) the sectoral patterns of FDI as suggested by Dutt (1997) and ii) the degree to which a country is exposed to FDI, e.g. the ratio of FDI to total investment.

This literature also neglects the possibility of a two-way relationship between FDI and economic growth. FDI might promote growth but it might also be attracted to countries that have high growth or the potential for it. Also, impacts of FDI on growth might be dependent on the pattern and volume of FDI, which in turn are influenced by economic growth rates and other characteristics of the host country. Host country factors therefore, could play a dual role in influencing the volumes and patterns of FDI inflows and the growth consequences of such FDI. Recognising the shortcomings of the existing literature, the next chapters of this thesis will study the possibility of a two-way relationship between FDI and economic growth. The next chapters will also consider some channels through which FDI may influence growth that have largely been ignored in the literature, including domestic consumption, domestic investment, exports and employment.

Chapter IV - Economic Growth, Foreign Direct Investment and the Trade Regime in four ASEAN Countries: Evidence from Simultaneous-Equation Panel Data Estimation

Introduction

This chapter studies the relationship between FDI and economic growth on the basis of empirical work on four ASEAN countries between 1975 and 1995. Following the Keynesian-Kaleckian approach, this study assumes that the economic growth of a developing country is demand-driven and constrained by its productive capacity, and that investment is dependent on the marginal efficiency of investment. With these assumptions, this study builds up a framework about the two-way relationship between FDI and economic growth. It hypothesises that FDI promotes high economic growth and that high economic growth induces FDI. FDI contributes to growth by generating demand and improving the productive capacity of the country. FDI, in turn, is attracted to a country with high economic growth because high growth positively influences investors' profitability and confidence. Moreover, an Export-Oriented Regime (EOR) could strengthen the relationship between economic growth and FDI: if EOR is implemented in a host country this could enhance the attractiveness of the country to FDI and increase the impacts of FDI on its growth.

This chapter contributes to the existing literature by building up a framework for the nature and mechanism of the relationship between economic growth and FDI and empirically testing the hypotheses put forward by the framework for four ASEAN countries: Indonesia, Malaysia, Singapore and Thailand between 1975 and 1995. These countries are chosen for empirical testing because they have been among the largest FDI recipients in developing countries and have also achieved higher economic growth rates than most other developing countries in the last few decades, especially between

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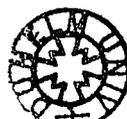
1975 and 1995. It is therefore interesting to examine whether the two-way relationship between FDI and economic growth exists in these countries. Key findings from the simultaneous-equation estimation for fixed-effects panel data are strongly consistent with our hypotheses: during 1975-1995 FDI contributed to high economic growth in the ASEAN countries and high growth of these economies was a key factor in attracting FDI. Also, we find that the implementation of EOR in the ASEAN countries strengthened the two-way relationship between economic growth and FDI in these countries.

The rest of this chapter is structured as follows: Section 1 discusses the theoretical framework and hypotheses of the study. Section 2 provides an overview of economic development, the trend of FDI, government policies toward FDI and the role of FDI in trade of the four ASEAN countries during 1975-1995. Section 3 discusses the model specifications, methodology and data for the empirical tests. Section 4 presents the test results. Section 5 concludes the chapter.

1 - Economic Growth, FDI and the Trade regime

This section presents a theoretical framework of a two-way relationship between FDI and economic growth: FDI could promote economic growth and high economic growth could induce more FDI. The choice of trade regime is of paramount importance for this relationship. If EOR is adopted, it will strengthen the relationship between economic growth and FDI.

1.1 - Contribution of FDI to Economic Growth

Our theoretical arguments are based on the Keynesian and Kaleckian notion that economic growth is demand-driven and productive-capacity-constrained. FDI could contribute to growth by raising demand and improving productive capacity. The

implementation of EOR could enhance the positive impacts of FDI on economic growth.

1.1.1 - Obstacles to Economic Growth in Developing Countries

Following Keynes and Kalecki[1], we assume that producers' output decisions depend on demand: expected demand determines firms' decisions to produce while actual demand generates profits that enable firms to continue and expand their production. We assume that demand has two main elements: domestic demand, which in turn is comprised of domestic consumption and domestic investment; and foreign demand for the export products of the country. In developing countries domestic consumption and investment tend to be small because the majority of people have low income, and resources - financial, technological and human - are limited. Foreign demand for the export products of the country is low because most developing countries have comparative advantage in natural resources and labour-intensive production[2]. Firms in developing countries face enormous problems such as lack of knowledge, and barriers to trade set by developed countries, in getting access to the international market. Insufficiency in demand, resulting from low domestic consumption, domestic investment and foreign demand, is an obstacle to the economic growth of developing countries.

Developing countries also face another obstacle to economic growth, i.e. inadequacy in productive capacity (Kalecki, 1976, Chapter 2). This makes the problem of insufficiency in demand of developing countries very much different from that of developed countries. As Kalecki (1976) has pointed out, in developed countries, a certain level of productive capacity has already been built up and inadequacy of demand leads to under-utilisation of such capacity, thus slowing down economic

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[1] Keynes (1936), Kalecki (1954, 1976)
[2] See for example Thirlwall (2000)

growth. In developing countries there is, however, a deficiency of productive capacity rather than its under-utilisation as in developed countries.

These two obstacles to economic growth in developing countries, i.e. insufficiency in demand and inadequacy in productive capacity, interact and form a vicious circle in which inadequate productive capacity hinders job creation and income generation, keeping domestic demand at a low level, and low demand constrains the expansion of productive capacity. Deficiency in productive capacity to produce for exports, e.g. lack of capital equipment or an efficient management system, is also a key factor keeping foreign demand at a low level, thus holding back economic growth in developing countries.

1.1.2 - Impacts of FDI on Economic Growth

In the Keynesian and Kaleckian approach, investment is a key determinant of economic growth[3]. An increase in investment raises demand because investment is an element of demand itself and it generates other elements of demand such as consumption. Increases in investment also build up the country's productive capacity. Like the other types of investment, FDI can tackle the two major obstacles to economic growth in host developing countries, i.e. raise demand and improve productive capacity. Considering the shortage of financial resources in developing countries[4], the role of FDI could be crucial in the economic growth process of these countries.

FDI could tackle the problem of insufficiency in demand by raising domestic consumption, domestic investment and foreign demand for export products of the country. There are several channels through which FDI could boost domestic consumption. *First*, the operation of FDI in the host country creates employment and generates income. The effect of FDI on employment is not limited only to jobs created within FDI firms. Jobs could also be created in firms that act as suppliers, distributors,

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[3] See e.g. Robinson (1962), Kalecki (1954, 1976)
[4] See e.g. Fry (1995).

transporters or any other ancillary industries for FDI firms. FDI could have multiplier effects on employment if it spurs other investment, which in turn creates employment. Assuming that higher income leads to higher consumption, FDI could raise domestic consumption through its impacts on employment and income. *Second,* FDI firms could have impacts on consumer tastes and habits. With their knowledge in marketing and product development, FDI firms could introduce new products and consumption habits for consumers in the host country[5] and thus boost domestic consumption.

The activities of FDI firms in a country could generate domestic investment. Domestic firms could become involved in supplying, distributing, transporting or any other ancillary business for FDI firms. Increases in FDI could result in a surge in construction and infrastructure development because the activities of FDI firms would raise demand for building, manufacturing sites, electricity, telecommunication and infrastructure. Even when FDI firms import all materials, intermediate inputs and capital goods, there are still some certain inputs that they need to acquire within the host country such as electricity. It should be noted that the extent to which domestic investment increases due to an increase in FDI is highly dependent on the degree of linkages between FDI and domestic economy. For example, if FDI imports the majority of its inputs rather than sourcing locally domestic investment will increase only in industries that provide supporting services for FDI[6].

FDI, especially export-oriented FDI, could increase the exports of the country, i.e. increase foreign demand, because foreign firms normally have internationally recognised brand names, established marketing channels and knowledge about consumer taste in export markets[7]. Increases in international production and in intra-firm trade of multinational corporations are also key factors that enable foreign firms to

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[5] See e.g. UNCTAD (1992)

[6] Increases in FDI could also result in more FDI in ancillary industries. For example FDI from big Japanese firms often brings more FDI from other Japanese small and medium firms, which act as suppliers for the big firms (Fujita, 1995).

export their products[8]. Endowed with such factors, FDI tends to be at an advantage over domestic investment in accessing foreign markets.

The impact of FDI on productive capacity is quite straightforward. It is argued that FDI brings technology, capital equipment and entrepreneurial skills, which could improve the productive capacity of host countries[9]. The impacts of FDI on improving productive capacity not only could help in satisfying domestic demand that was previously unfilled but also could influence and raise domestic demand by changing consumers' tastes and demand[10]. More importantly, FDI could improve the productive capacity of export-oriented industries. Besides having intangible assets such as understanding of foreign markets, marketing expertise and networking relations, *supra*, FDI also provides capital equipment and management systems that enables firms to meet the requirements of export markets.

1.1.3 - EOR and Contribution of FDI to Economic Growth

Export expansion could be the path for developing countries to promote high economic growth because export potential allows firms to increase output and productive capacity without being constrained by small domestic markets. FDI, with its specific-advantages discussed above, can make an important contribution to economic growth through improving export performance. In this context, the choice of trade regime in a host developing country matters and among different trade regimes, the implementation of EOR could facilitate the contribution of FDI to economic growth.

In developing countries, EOR is designed to encourage exports and includes at least one of the following[11]: 1) Import barriers (tariff and non-tariff) are eased to enable exporters to import needed technology and raw materials; 2) Financial and fiscal

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[7] Hellener (1973)
[8] See e.g. UNCTAD (2002).
[9] However such improvements may occur in the foreign sector only and whether such improvements have positive impacts on the productive capacity of the domestic sector is a different issue; for further details see Chapter III.

incentives are granted such as tax exemptions and subsidised export credit; and 3)

Export Processing Zones (EPZs) are set up, normally in major port areas, and provide

favourable terms to export-oriented foreign investors. It is important to note that import

liberalisation is not necessarily an essential element of EOR. EOR tends to reduce

import barriers only for inputs for export production. Protective barriers for importation

of other products may not be dismantled when a country moves towards export-

orientation. A country could be relatively protective and yet export-oriented at the same

time (see e.g. Chia, 1999 about the coexistence of export promoting and protective

measures in ASEAN countries). Nevertheless, increases in imports of capital goods and

inputs for the export production enable a country to improve its export performance.

Without increases in such imports, export expansion may not occur. Accordingly, we

suggest that it is the degree of openness - an indicator that considers both exports and

imports – as a result of EOR that affects growth, rather than export expansion alone[12].

Under EOR, foreign firms could import needed capital goods and materials to

expand their productive capacity. The reduction of tariff makes it more beneficial to

export and to get involved in globalised production; thus FDI firms could expand their

productive capacity without being constrained by their limited domestic market. FDI

could boost foreign demand and productive capacity, and thus contribute more to

economic growth[13]. The contribution of FDI to economic growth could be enhanced

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[10] Working and living environments in developing countries could change with the presence of FDI (UNCTAD, 1992).

[11] See e.g. UNCTAD (2002)

[12] The relation between FDI, exports and imports makes it difficult to assess the net impact of FDI on the Balance of Payments. Increases in FDI could improve the current and capital account due to increases in exports and capital inflows. Nonetheless, such improvement could be offset by increases in imports and capital outflows resulting from the operation of FDI such as profit repatriation. The impacts of FDI on the capital account could also be over-estimated because a proportion of FDI could come from retained profits and/or borrowing in the domestic markets.

[13] Balasubramanyam et al. (1996) argue that FDI is much more efficient in promoting growth when it is allowed to operate in a distortion-free environment, which is defined as efficient, with fair play of market forces and competition. They consider the environment created by an export-promoting policy as the one that has those characteristics. We believe that the implementation of export-promoting policies could create inefficiency and distortion in the form of government intervention such as incentives and export credit, and in the form of dualism, i.e. the coexistence of the technology-advanced foreign sector and the laggard domestic sector.

further under EOR if there were linkages between export-oriented FDI and domestic sector. There is evidence of such linkages in some more-developed Asian countries. For example, it is reported that in Korea the emphasis on export-led growth and an FDI promotion strategy enabled foreign firms to facilitate technological upgrading in several key Koreans industries (see, for example, Hill and Athukurala, 1998). The experience of Latin American countries in the 1970s and 1980s provides some insight for the above proposition. Latin American countries have a long history of hosting domestic-market-oriented FDI. However the limited domestic market and lack of an EOR kept production of some sectors such as the automobile industries unable to reap the benefits of economies of scale, leading to inefficient production, high prices, and lack of competitiveness in the world market standards (Moore, 1972 and Nunnenkamp, 1997). *Inter alia*, the absence of EOR is a key issue that has made the economic performance of Latin America in the 1980s and 1990s lag behind that of East Asia, which pursued export-led and FDI-led growth (Nunnenkamp, *ibid*).

It should be recognised that EOR *per se* is not a sufficient condition for FDI to contribute to growth, especially to the extent that FDI becomes a driving force for high economic growth. Rather it is the overall economic and social environment and government commitment to growth, especially the launch of supporting policies such as the improvement of the physical and social infrastructure needed to develop the export sector and linkages between FDI and domestic economy, that allows FDI to contribute to economic growth. Without such factors, FDI may not be able to accelerate economic growth even if EOR is implemented. The experience of Mauritius and Sri Lanka shows that inflows of export-oriented FDI are not always accompanied by high economic growth despite the implementation of EOR. Although these two countries have successfully used the EOR to attract FDI in low-skill activities such as textiles and garments since the early 1970s, they both have had limited success in attracting FDI in

high-skill industries, in promoting linkages between FDI and domestic firms, and in making FDI work in achieving their growth targets[14]. In China, FDI during 1979-1986 failed to promote growth as the government had expected. During this time, export-oriented FDI was encouraged but limited to operating in Special Economic Zones. This FDI used cheap labour and exported total output. Despite various incentives originated from EOR, FDI in these zones became enclaves and did not have significant effects on the domestic economy. The impacts of FDI on the economic growth of China in this period were negligible[15].

1.2 - Economic Growth as a Determinant of FDI

In this section we show that expected profitability and confidence are two main determinants of FDI. High economic growth could induce more FDI because it positively affects profit expectations and the confidence of foreign investors. Implementation of EOR improves the positive effect of high economic growth on FDI.

1.2.1 - Determinants of FDI

The investment function in the Keynesian approach depends crucially on the 'marginal efficiency of investment'[16]. Under this approach, expected profitability and confidence about the future influence the 'marginal efficiency of investment', which, in turn, determines investment decisions. Expected profitability of investment is essentially dependent upon expected growth in sales and cost factors. Following the Keynesian and Kaleckian investment theory, expected growth of sales, cost factors and confidence about the future are assumed to be key determinants of FDI. It should be noted here that different kinds of FDI might value factors differently[17].

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[14] The proportion of low-skill FDI in Mauritius is 98.1% in 1985-1992 and 97.9% in 1993-1997. The situation in Sri Lanka is slightly better with 83.9% low-skill FDI in 1987-1992 and 72.6% in 1995-1998 (Wignaraja G., 1998) and Lall, S. and G. Wignaraja (1998).
[15] See e.g. Chen Chunlai (1997)
[16] Keynes (1936), Kalecki (1954, 1976) and Arestis (1992) for investment theory in the Post-Keynesian tradition
[17] For a literature review on FDI location determinants see Chapter II of this thesis.

FDI to developing countries could be broadly categorised as domestic-market-seeking FDI and efficiency-seeking FDI. For domestic-market-oriented FDI, expected growth of domestic sales and cost factors are important although the former could be a more important factor. Efficiency-seeking FDI is chiefly concerned with factors that enable producers to reduce costs such as the availability of relatively cheap labour or incentives provided by host governments. This type of investment tends to use the host developing country as a platform to produce and export to home or third countries, and thus domestic sales might not be a primary objective. Confidence about the future, which not only deals with host country's economic prospects but also government's attitude toward FDI, is important for both types of FDI.

The decision to make new FDI in a host developing country could be negatively affected by the presence of existing FDI in the country. This negative relationship is because the presence of FDI in the same industry could easily saturate the limited domestic market. More importantly, existing FDI operations might fully utilise skilled labour, infrastructure and other supporting facilities in host country. Such factors are important for both types of FDI but might not be easily and quickly upgraded and expanded in a developing country.

1.2.2 - Economic Growth as a Determinant of FDI

Economic growth, *inter alia*, is a crucial factor that determines how much FDI a developing country could attract. This is because rates of economic growth could influence the expected growth of sales, cost factors and confidence of investors. Overall, a rapidly growing economy is assumed to provide a relatively better opportunity for making profits than the ones growing slowly or not growing at all (Lim, 1983). For market-seeking FDI, high rates of economic growth could indicate a growing domestic market and thus higher expected growth of sales. For both types of FDI, high economic growth rates could promise a certain level of infrastructure

development that is cost beneficial. High economic growth could also signal a country's good development potential and deliver the pro-business and pro-growth message of the government more efficiently than many other policy instruments. High economic growth, accordingly, enhances the confidence of foreign investors. When high economic growth is associated with improved infrastructure and development as well as with improved confidence on the part of investors, it could act as a positive factor for other types of FDI such as natural-resource-seeking FDI. Furthermore, high economic growth could offset the negative impact of existing FDI discussed above. The domestic market is less likely to be saturated when it is growing rapidly. Domestic resources are also less likely to be fully utilised if high economic growth is accompanied by a host country's effort to develop its physical and human infrastructure. Jackson and Markowski (1994), for example, find that high economic growth is the most prominent factor that attracts FDI to the Asian and Pacific countries. Goldar and Ishigami (1999) find that Japanese FDI has moved from utilising cheap labour in Asia to produce for export to the U.S. and EU markets to taking advantage of growing Asian markets and producing final consumer goods for these markets.

It should be noted here that high and consistent economic growth, rather than high and fluctuating growth, positively influences FDI. High and sustained growth not only promises a better prospect of doing business in the country, but also indicates a long-term prospect, which is always praised by far-sighted investors. This persistence of high economic growth might also reveal sound and stable macroeconomic conditions, which is a priority in the checklist of foreign investors[18]. Among developing countries, some biggest FDI recipients such as Singapore, Malaysia and Taiwan are the ones with high and relatively stable growth rates over a long period. This proposition could, to some extent, explain why East Asian countries, which have

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[18] See Chapter II for discussion on the theoretical and empirical arguments about political and economic stability as a determinant of FDI.

maintained high and stable economic growth over the last few decades, have been attractive to FDI (see Section 2.1).

1.2.3 - EOR and Impacts of Economic Growth on FDI

When a developing country implements EOR, as discussed in section 1.1.3, the country's attractiveness for FDI due to high economic growth is enhanced because EOR generally provides more profitable opportunities for FDI. Under EOR foreign firms could find it more cost beneficial to export and get involved in the trend of globalised production. It allows FDI to import capital goods and needed inputs at lower tariff rates. Financial and fiscal incentives are also offered. For market-seeking FDI, EOR might reduce high competition in the domestic market and raise sales expectation because more domestic income is generated. Without EOR in practice, even if a developing country could manage to have consistently high economic growth, firms - domestic and FDI - would sooner or later face high competition. Expected growth of sales and thus expected profitability might start falling. This is because the country's domestic market and income are generally small and would need time to expand. On the contrary, with EOR policy, the country's attractiveness for FDI due to high economic growth is enhanced.

1.3 – Two-Way Relationship between Economic Growth and FDI

The above arguments suggest the possibility of a two-way relationship between FDI and economic growth: FDI could positively influence economic growth and high economic growth is a positive determinant of FDI. Graph IV.1 depicts this framework. There are two directions of influence. Direction A is from FDI to growth. FDI could contribute to economic growth through three channels: by generating domestic demand (A1) and foreign demand (A2), and improving productive capacity of the country (A3). The second direction of influence is Direction B - from economic growth to FDI. FDI is attracted to a country with high economic growth because economic growth is a

crucial factor influencing the growth of sales to the domestic market (B1), cost factors (B2) and confidence about the future (B3), which under the Keynesian and Kaleckian approach are key determinants of FDI.

Graph IV.1 – The Two-way Relationship between Economic Growth and FDI

Direction A   Direction B
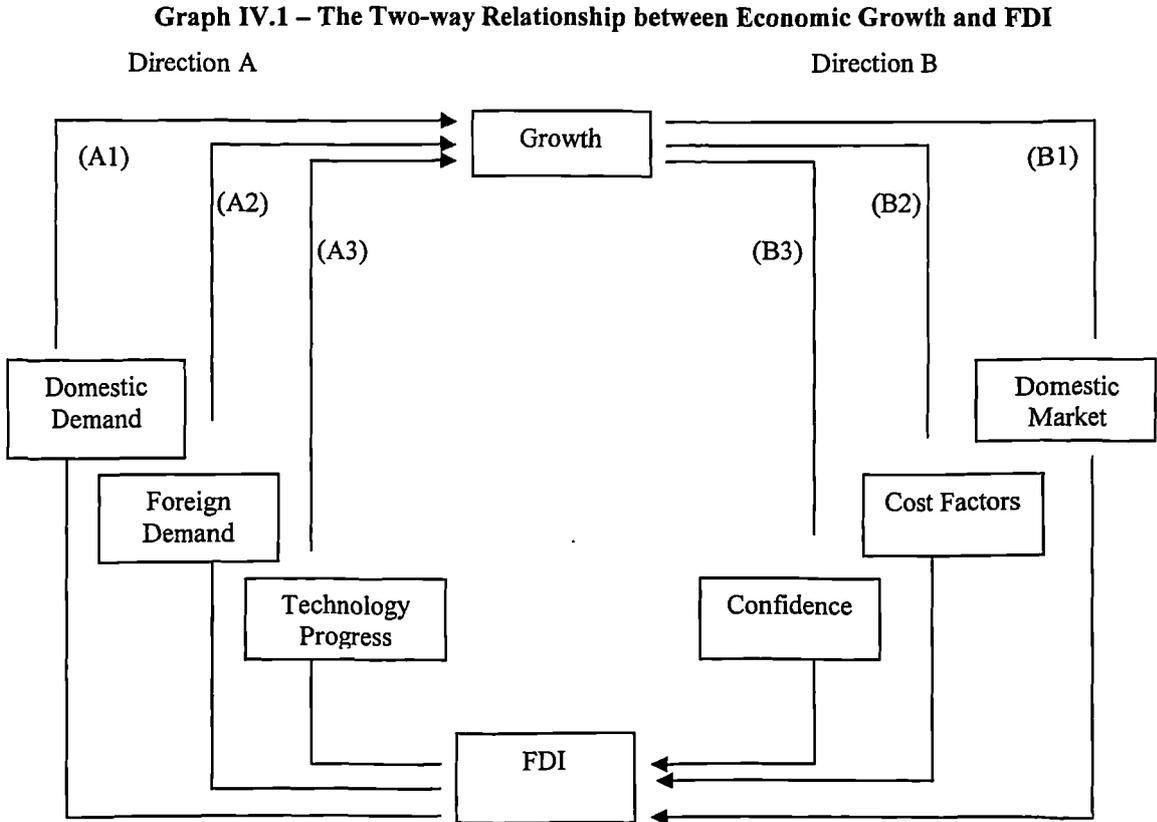
The implementation of EOR in the host country could enhance the contribution of FDI to economic growth and make the country more attractive to FDI. By encouraging FDI firms to export, EOR could enhance the positive impacts of FDI on domestic and foreign demand (A1 and A2) and productive capacity (A3), and thus on economic growth. EOR vigorously encourages firms to produce for export by offering various incentives and by reducing trade barriers. EOR, therefore, could influence cost factors positively (B2) and boost the confidence of foreign investors by signalling the pro-growth and pro-business commitment of government (B3), thus inducing more FDI, especially export-oriented FDI. EOR plays a vital role, being a necessary condition for the existence of the bi-directional relationship between growth and FDI. Without EOR, a small domestic market, where a majority of the population have low

incomes, constrains the contribution of FDI to growth and the amount of FDI that a country can attract.

So far there have not been many attempts to explore this issue. Tsai (1994) is an exception. Deriving from such technical issues as the endogeneity of explanatory variables and validity of single-equation regressions, Tsai argues that there is a simultaneous relationship between economic growth and FDI. Tsai's arguments are based on the modernisation and dependency hypotheses: in the dependency approach, FDI can have short-run positive impacts on growth but in the long-run FDI will have negative impacts on growth; in the modernisation approach, FDI has positive impacts on growth[19]. High economic growth attracts FDI because it is taken as a favourable signal by foreign investors in making investment decisions. Tsai, however, finds no supporting evidence, i.e. neither does FDI have positive impacts on growth nor is FDI attracted to high-growth countries. Our theoretical arguments suggest that Tsai's findings could be due to the periods of time that his study considers. In these periods, 1975-1978 and 1983-1986, the level of FDI was relatively low, and import-substitution policies were still widely used in most developing countries[20].

1.4 – Hypotheses and Testing Hypotheses

Our theoretical framework hypothesises that there is a two-way relationship between economic growth and FDI and that this relationship is enhanced with the implementation of EOR. To empirically test this framework we adopt the disaggregated approach[21], which selects only countries that possess some of the key characteristics in the framework. These characteristics are: relatively high economic growth rates; relatively high amounts of FDI; and the implementation of EOR. Among developing countries, the four ASEAN countries - Indonesia, Malaysia, Singapore and Thailand -

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[19] See Chapter III for more discussion about the dependency and modernisation approaches.
[20] Tsai's failure might also be due to a sampling problem, which is the inclusion of countries that have different characteristics and levels of FDI in the sample (see Chapter III for further details).
[21] See Chapter III for more details.

seem to possess all these characteristics during 1975-1995. These countries have been among the largest FDI recipients in the last few decades and also among the highest growth developing economies. The FDI inflows to the ASEAN countries started increasing rapidly from the mid 1980s. In 1995 the total stock of FDI in these countries was more than US$ 156 billion accounting for 18 per cent of the total FDI stock in the developing world (UNCTAD, 2002). EOR has also been adopted since the late 1960s in Singapore and since the mid 1980s in the other countries. Most other large FDI recipients such as some Latin American countries did not implement EOR until the early 1990s. The two-way relationship, if it exists, i.e. FDI promotes growth and high growth attracts FDI, is likely to be found in the countries selected.

Based on the theoretical framework developed above, the following are the main hypotheses regarding the relationship between economic growth and FDI in the four ASEAN countries during 1975-1995:

Hypothesis 1: There is a two-way relationship between FDI and high economic growth in the four ASEAN countries during 1975-1995: FDI contributed to the economic growth of these countries and high economic growth in these countries was a positive determinant of FDI.

Hypothesis 2: EOR implemented in the ASEAN countries was a positive factor in the relationship between FDI and economic growth, i.e. EOR enhanced the contribution of FDI to growth and enabled these countries with high growth to attract more FDI.

2 - The Economies and FDI of ASEAN Countries during 1975-1995

2.1 - The Economies of ASEAN countries

The four ASEAN countries, Indonesia, Malaysia, Singapore and Thailand are among the few developing economies that were comparatively dynamic and, to some extent, obtained impressive economic achievements during the second half of the 20th

century. During 1960-1995, the economic growth rates of these countries were among the highest and most stable in the developing world (the round points represent these countries in Chart IV.1). Chart IV.1 shows that in this period, annual average growth rates of real GDP of the ASEAN countries were above 4%, higher than in all other developing countries (except Botswana). The annual growth rates of these economies also have low values of standard deviations, indicating some degree of growth stability[22]. No other countries with the same degree of growth stability had higher growth rates than these countries. Regionally, African countries have the lowest and most fluctuating rates of economic growth. The growth of Latin American economies is more stable than those of Africa but lower and more inconsistent than those of the ASEAN and the East Asian NICs.

Chart IV.1 - Real GDP Growth Rates of Developing Countries (1960-1995)
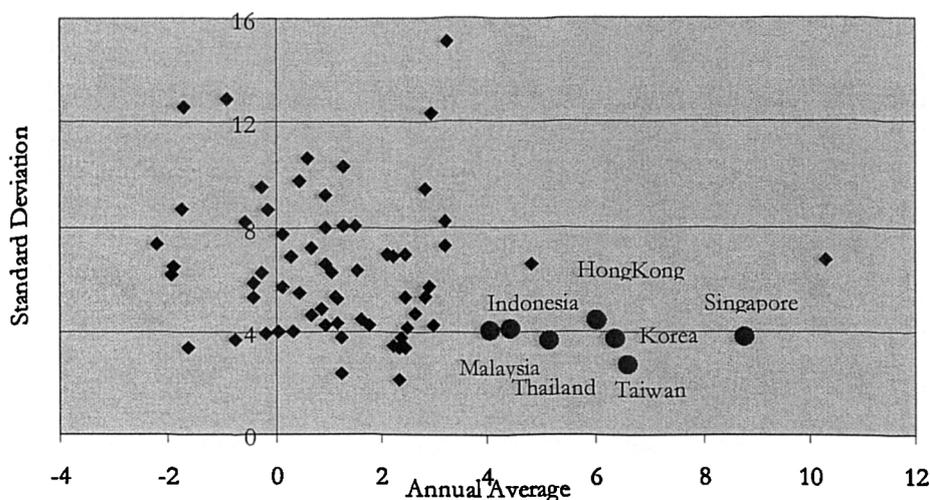
Source: compiled from the Pen World Table. See Appendix IV.1 for more details.

The four ASEAN countries have also been among the largest FDI hosts among the developing countries. FDI to the ASEAN countries started increasing rapidly from the mid 1980s. In 1995 the total stock of FDI in these countries was more than US$ 156 billion, accounting for 18 per cent of the total FDI stock located in the developing world (UNCTAD, 2002). Table IV.1 provides some key indicators for the ASEAN

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[22] Author's calculation from Pen World Table for annual average growth of GDP and its standard

economies. Among the ASEAN countries, Indonesia is the country that has the largest GDP, which nearly triple that of Singapore or Malaysia. With GDP per capita of US$ 832 at 1990 prices, Indonesia however is the country that has the lowest level of income per capita at US$ 832 in 1995. GDP per capita of Malaysia and Thailand is US$ 3,147 and US$ 2,165, respectively. Singapore has the highest level of income per capita at US$ 18,963.

Table IV.1 - Key Indicators of four ASEAN economies as of 1995

(In 1990 US dollar prices)

	GDP in mil. US$ (Index Singapore =100)	GDP per capita in US$ (Index Singapore = 100)	Export volume (mil. US$)
Indonesia	161,457 (290.2)	832 (4.4)	46,168
Malaysia	64,871 (116.6)	3,147 (16.6)	72,337
Singapore	55,635 (100)	18,963 (100)	128,706
Thailand	128,655 (231.2)	2,165 (11.4)	60,929

	Exports /GDP	(Exports + Imports)/GDP	Manufacturing Value Added per worker (US$)	Pub. Spend on Edu. per capita (US$)
Indonesia	26.3%	53.9%	4,181	5.54
Malaysia	95.4%	194.8%	13,522	150.75
Singapore	177.4%	339.1%	44,447	568.34
Thailand	41.8%	89.75%	9,393	77.7

Source: compiled by the author, for data sources see Appendix IV.2

The ASEAN economies experienced substantial changes in the last few decades of the 20th century, most notable were the structural changes from agriculture-based to manufacturing-based economies and from import-substitution toward export-orientation strategies. Below is a brief overview on the economic structure, trade, human capital development, productivity and the role of the State in these countries. We also compare the economic performance of the two sub-periods, 1975-1985 and 1986-1995.

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deviation for eighty seven developing countries.

2.1.1 - Structure of the ASEAN Economies

The economies of Indonesia, Malaysia and Thailand had undergone remarkable structural changes in the 1980s, during which the share of agriculture in GDP decreased and, at the same time, the share of manufacturing increased. In Malaysia, the share of manufacturing in GDP started surpassing the share of agriculture by the early 1980s. This shift took place in Thailand and Indonesia later that decade (Chart IV.2). In Singapore this change did not occur because agriculture always played a minor part (the share of agriculture in GDP was less than 2%). By 1995, Indonesia was still the country that had the highest share of agriculture, accounting for 17% of GDP in 1995 (compared with 31% in 1976). Singapore has the lowest share of agriculture in GDP of less than 0.2%.

Chart IV.2 - Structure of Four ASEAN Economies (1975-1995)

(Share of GDP)
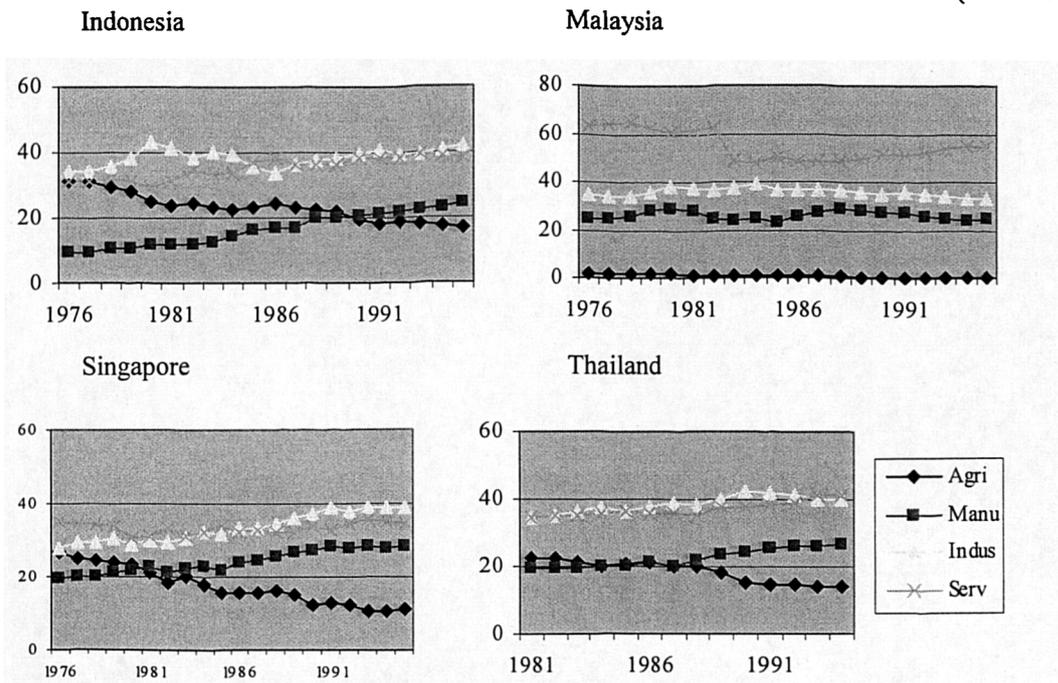
Source: compiled from ADB (various issues). The share of industry in GDP includes the share of manufacturing. See Appendix IV.3 for more details.

During 1975-1995, the manufacturing sector in Indonesia, Malaysia and Thailand, increased rapidly, in terms of its contribution to GDP, capital stock and employment. By 1995, manufacturing accounted for around a quarter of GDP in these economies. The service sector in these countries also had increasing shares in GDP.

With more than 50% of GDP represented by services, Singapore is the country that depends most on services. The share of services in the economies of Indonesia, Malaysia and Thailand ranges between 30% and 40%.

2.1.2 - Trade

Since the 1980s along with the implementation of EOR, the export performance of the ASEAN countries has improved substantially. The export structure shifted increasingly away from traditional primary outputs such as agro- and resource-based products, toward manufacturing[23]. In the four countries, the share of manufacturing exports in total exports increased rapidly. In Indonesia the share of manufacturing exports in total exports increased from 3% in 1981 to 51% in 1995. In the same period Malaysia and Thailand tripled this ratio from 20% and 26% to 75% and 73%, respectively. Singapore raised its manufacturing share in export from 48% to 84%[24].

Chart IV.3 shows that manufacturing exports helped to increase total exports of these countries both in absolute terms and as a share of GDP. During this period Singapore was the largest exporter and also the most open economy. In 1995 the volume of Singaporean exports was twice as large as its own GDP[25]. In terms of trade performance (Table IV.1) next to Singapore are Malaysia and Thailand. Indonesia is the smallest exporter and also the least open economy. Increases in manufacturing exports also closed the gap between manufacturing exports and manufacturing imports remarkably (see Chart IV.3).

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[23] Chia (1999)

[24] Data from World Bank (2000)

[25] It should be noted here that the impressive trade indicators of Singapore is in part due to the role of the country as a entre-pot for other countries in the region (for details see Chia, 1997).

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Chart IV.3 - Share of Manufacturing Export/Import in Merchandise Export/Import in the ASEAN Economies (1980-1995)

Indonesia   Malaysia

Singapore   Thailand
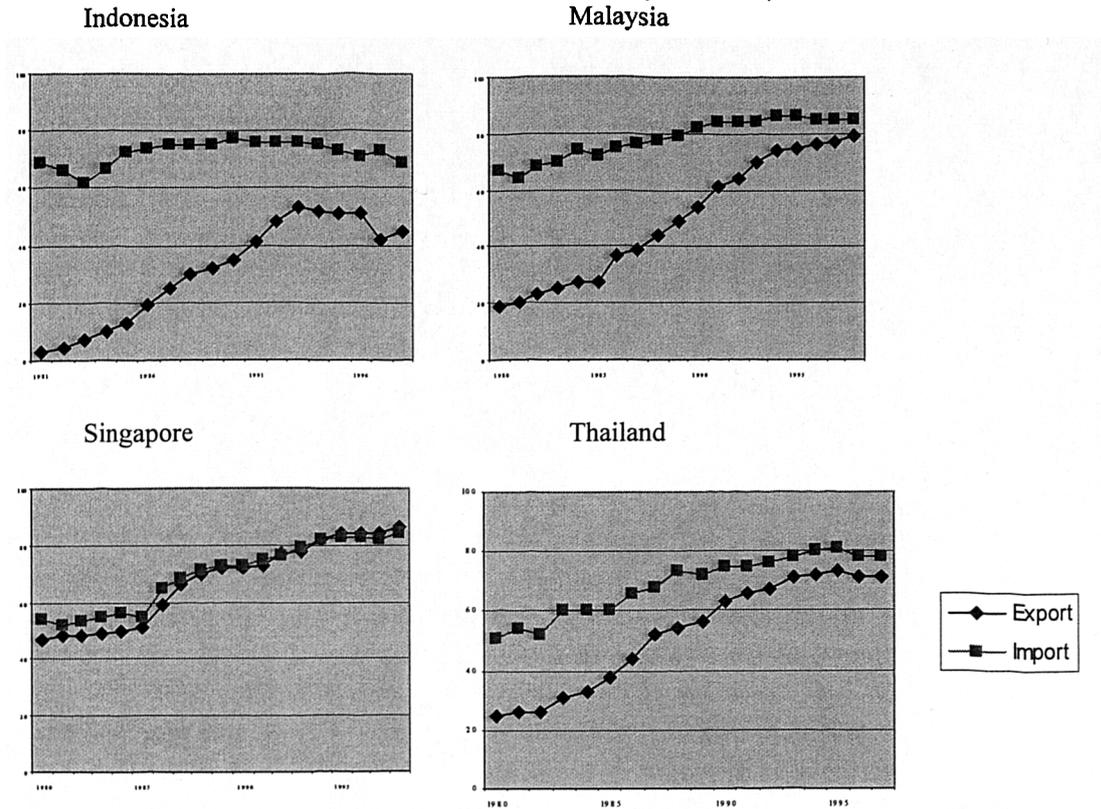
Source: compiled from World Bank (2000), See Appendix IV.4 for details.

2.1.3 - Human Capital and Productivity

Singapore is the country that has invested heavily in human capital development. In 1995 public spending on education in Singapore was around US$ 570 per head, compared with US$ 150 in Malaysia, US$ 77 in Thailand and only US$ 5.5 in Indonesia. Singapore also has the highest level of productivity in terms of manufacturing value-added per worker while Indonesia has the lowest level of productivity. The value added produced by a Singapore worker in manufacturing in 1995 was US$ 44,447, which is three-times higher than a Malaysian, four-times higher than a Thai and ten-times higher than an Indonesian (Table IV.1).

2.1.4 - Government Interventions

Although the ASEAN countries are sometimes depicted as having successfully adopted liberalisation and *laissez-faire* policies to promote economic growth, the governments of these countries in fact have been rather strong interventionists (see e.g. Hill, 1994). All countries have actively implemented guided industrial policies and

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economic development strategies. Selected fiscal and financial incentives and progressive human capital development programmes have been implemented, especially in Singapore and Malaysia. The leading role of the State in these countries is particularly apparent through policies to attract FDI and pursue export-led and FDI-led growth, especially since the mid 1980s (see Section 2.2.2 below for details).

2.1.5 - Economic Performance of Two Sub-Periods, 1975-1985 and 1986-1995

In the early 1980s the ASEAN economies faced recessions due to a variety of internal and external factors such as falling prices of oil and commodity products and appreciation of the Japanese Yen leading to the surge of FDI from Japan. In response, export-oriented policies have been implemented since the mid 1980s to replace the import-substitution strategies of the previous period. All countries actively encouraged FDI and promoted the private sector. Table IV.2 shows that the economic performance of the ASEAN countries in the period 1986-1995 was more impressive than that in the preceding period, 1975-1985. The annual average economic growth rate of each country during 1986-1995 was higher than in the previous period. For instance, the annual average growth rate of the Indonesian economy was 8.8% in 1986-1995 compared with only 7% in 1975-1985. The annual average growth rate of Thailand in 1986-1995 was 9.4% compared with only 6.5% in 1975-1985. Income per capita also increased substantially.

Table IV.2 - Key Economic Indicators of Two Sub-Periods (1975-85) and (1986-95)

(In 1990 US dollars prices)

	GDP per capita growth (annual average %)		GDP per capita (annual average, US$)		Export growth (annual average %)	
	1975-85	1986-95	1975-85	1986-95	1975-85	1986-95
Indonesia	6.7	7.5	440	665	1.3	6.4
Malaysia	6.3	7.8	1711	2451	6.2	17.4
Singapore	7.0	8.8	8189	14287	5.0	12.7
Thailand	6.5	9.4	854	1585	2.9	23.5

Source: see Table IV.1

The export performance of the ASEAN countries in 1986-1996 improved substantially compared with that in 1975-1985. The annual average growth rate of export of Indonesia increased by four-fold. Export growth rates in Malaysia and Singapore more than doubled. Thailand especially experienced rapid growth of exports, which increased at an annual rate of 23.5% during 1986-1995 as compared with only 2.9% in 1975-1985.

2.2 - FDI in ASEAN countries (1975-1995)

2.2.1 - Trend of FDI in ASEAN countries

The four ASEAN countries have been among the largest FDI hosts in the developing countries. In 1980 the stock of FDI in these countries accounted for 9.4% of the total stock of FDI in the developing countries (Table IV.3). Since the mid 1980s FDI to ASEAN countries increased rapidly. A significant part of this was FDI from Japan that looked for new and cheaper-production cost locations due to the Yen appreciation[26]. In 1995 the total stock of FDI in these countries was more than US$ 156 billion - compared with US$ 22 billion in 1980 - accounting for 18% of the total FDI stock in the developing world. The degree of FDI exposure in each country varies. Singapore is the most open to FDI with the total FDI stock accounting for 70% of its GDP in 1995. The ratios of FDI stock to GDP in Indonesia and Malaysia are 25% and 33%, respectively. Thailand is the least dependent on FDI with a share of FDI stock in GDP of 10%.

Until the early 1980s, FDI to the four ASEAN countries was concentrated in natural-resource-based and domestic-market-oriented industries. Export-oriented FDI firms mainly used un-skilled workers for simple assembly tasks and were located in free-trade zones to enjoy tariff incentives. There was almost no linkage between foreign firms and the domestic economy. Since the mid 1980s FDI has concentrated in

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[26] See e.g. Hill and Athukurala (1998)

manufacturing, especially electronics and electrical products, and has been located outside free-trade zones. FDI has also gradually shifted towards more value-added, skill- and technology-intensive and export-oriented manufacturing activities in Singapore and Malaysia, and to some extent in Thailand and Indonesia. A large share of FDI however still goes to import-substituting activities such as automobile production.

Table IV.3 - Stock of FDI of the ASEAN countries (1980 – 1995)

(in current million US dollars and as % of GDP in parentheses)

Host region/Year	1980	1985	1990	1995
Indonesia	10,274	24,971	38,883	50,601
	(14.2)	(28.6)	(34.0)	(25.0)
Malaysia	5,169	7,388	10,318	28,732
	(21.1)	(23.7)	(24.1)	(32.9)
Singapore	6,203	13,016	28,565	59,582
	(52.9)	(73.6)	(76.3)	(70.0)
Thailand	981	1,999	8,209	17,452
	(3.0)	(5.1)	(9.6)	(10.4)
Total FDI stock in ASEAN Countries	22,627	47,374	85,975	156,367
Total FDI stock in Developing Countries*	240,837	347,237	487,694	849,376
Share of ASEAN in total stock of Developing Countries	9.4%	13.6%	17.6%	18.4%

Source: compiled from UNCTAD (2001)

* Not include Developing Europe, Central and Eastern Europe

Many of FDI activities in these countries, especially those in export-oriented industries belong to vertically integrated production networks of multinational corporations. FDI firms therefore are more export-oriented but also more import-dependent than their domestic counterparts. The presence of foreign firms in the ASEAN countries has also created the so-called dualistic industries, especially in electronics and electrical products, where foreign firms, though small in terms of number of establishments, have much more advanced technologies and dominate the value added and export shares of the industries. Meanwhile most domestic firms are

small or medium enterprises with laggard technologies, serving the local market[27]. We shall now discuss in detail government policies toward FDI in the ASEAN countries.

2.2.2 - Policies toward FDI in the ASEAN countries

A number of external challenges in the early and mid 1980s such as the surge of FDI from Japan and falling prices of oil and commodity products, which accounted for a large share of ASEAN exports, could be attributed to the implementation of policies to encourage and support FDI since the mid-1980s in the ASEAN countries. Various regional and national policies and activities to attract FDI have been promoted. Regional pro-active investment policies have been launched, such as economic growth triangles, and AFTA (ASEAN Free Trade Area), to take advantage of low labour and land cost in one nation (e.g. Indonesia) and surplus capital and industrial sophistication in others (e.g. Singapore)[28]. Nationally, there is one government agency in charge of facilitating and promoting FDI in each country: the Investment Coordinating Board (BKPM) in Indonesia, the Industrial Development Authority (MIDA) in Malaysia, the Economic Development Board (EDB) in Singapore, and the Board of Investment (BOI) in Thailand.

Indonesia[29]

In the mid 1970s, after years of liberal policies, various restrictions were imposed on FDI in Indonesia. Only joint ventures were permitted and it was mandatory for these to divest to an Indonesian majority within a certain period. Such restrictions remained in effect until the mid 1980s. During this period FDI was motivated by a highly protected domestic market and concentrated in extractive industries such as oil and gas. A number of factors such as government interventions, high costs of production due to bureaucracy, lack of a supporting infrastructure for exports and a

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[27] See e.g. Thomsen (1999) and Chia (1999)
[28] For details see the ASEAN website: www.aseansec.org
[29] The material in this part is drawn from Pangestu (1997) and Thee (2001).

high level and complex structure of protection accounted for the modest amount of foreign investment attracted before the mid 1980s.

Falling prices of oil products, the main component of Indonesian exports, and the search for cheap-production-cost locations by firms from Japan and East Asian NICs, in the early 1980s were driving factors for the launch of export-orientation policies emphasising FDI and a series of macro adjustments and reforms, started in 1986. Among them were the relaxation of restrictions on foreign investment ownership linked to export-orientation and a general programme of reduced protection. However, FDI did not increase sharply until the early 1990s onward, after the government allowed 100% foreign ownership, imposed less stringent divestment requirements for projects, especially those in the electronics industry, and opened nine public goods sectors, e.g. power generation and telecommunication, to foreign participation.

Between 1987 and 1995 manufacturing was the sector that attracted most FDI. The share of FDI in manufacturing in total approved FDI was always above 50%. In 1989 and 1994, for example, this ratio reached 90% and 82%. Foreign firms in the manufacturing sector, especially those in two major export industries in Indonesia, textiles and garments, and electronics, are more export-oriented than domestic firms and contribute significantly to the total exports.

Despite the liberalised policies, a number of problems have arisen over the investment environment in Indonesia such as red tape, bureaucracy, and lack of a skilled labour force – and of training opportunities, technical personnel, engineers and managers. These, especially the poor quality of human capital, have been claimed as obstacles for FDI to contribute to the economic growth of Indonesia.

Malaysia[30]

From the early 1970s until the mid 1980s tariff protection and fiscal incentives were used widely in Malaysia to attract FDI into manufacturing to promote manufacturing exports. Labour-intensive investments in electronics and electrical industries were encouraged to absorb unskilled or semi-skilled domestic labour. Since the mid 1980s, major adjustments and market liberalisation were launched due to the commodity prices shock and fiscal imbalances. The government has encouraged investment in manufacturing production toward high value-added and technological-intensive sectors. R&D, linkages with local firms, and exports of high value-added products have been emphasised. FDI, especially in electrical and electronic products during this period, was more skill-intensive than the previous period. The share of investment in the electrical and electronic products sector in total FDI increased to 33% in 1994 from 3% in 1986. Also in 1994, the output of this industry accounted for 72% of manufacturing export earnings, changing Malaysia from the world-leading exporter of natural rubber to the world-leading exporter of electronic components. Since the mid 1980s, labour training has been emphasised by the government. A well-known example is the cooperation between the Penang state government and multinational corporations to establish the Skills Development Centre to provide necessary training and educational resources in Penang.

Singapore[31]

Singapore was the first among the four ASEAN countries to pursue an open strategy to FDI. During 1965-1975 the government encouraged FDI in order to develop the manufacturing and financial sectors. Labour and investment climate improvements were emphasised. In 1975-1985, however, Singapore lost its competitiveness and fell into recession due to a tight labour market, upward pressures on wages, and the rise of

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[30] The material in this part is drawn from Ling and Yong (1997) and Tham and Mahani (1999)

other developing countries with lower production costs in the region. The government decided to shift toward higher value added activities, including promoting investment in higher value-added and skills-intensive industries, encouraging automation, mechanisation and computerisation. During 1986-1995 Singapore continued its policies adopted in the previous period, focusing more on manufacturing and services as "twin pillars of the economy", deepening the technology base and formulating cluster development. To move to innovation-driven economic development, which requires greater efficiencies in using labour and capital resources to generate economic growth, human capital development has been stressed.

It is argued that FDI assumes a central role in Singapore's economy[32]. FDI in Singapore has been concentrated in manufacturing and services, particularly financial services. Until the mid 1980s, half of the FDI stock was concentrated in the manufacturing sector and the other half was in services, especially the financial service sector. In the last half of the 1980s and the early 1990s, more FDI was directed toward the service sector. By 1992, FDI stock in manufacturing had fallen to nearly one-third of the total FDI stock.

FDI has dominated the manufacturing sector in Singapore. Data from the 1992 Industrial Census show that 61% of the equity capital in Singapore's manufacturing sector was of foreign origin. By 1995 firms with foreign equity accounted for 76.4% of output and 85.9% of exports of the manufacturing sector. In electronics and petroleum refineries, the two sectors that accounted for more than half of manufacturing output, the foreign-equity ratios were 88% and 83%, respectively.

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[31] The material in this part is drawn from Chia (1997, 1999) and the website of the Ministry of Trade and Industry, Singapore: http://www.mti.gov.sg
[32] Chia (1997)

Thailand[33]

Thailand has a long history of openness to FDI however in the early stages FDI was limited to minority-ownership. Similar to other ASEAN countries, in the early 1980s the Thai economy was in stagnation due to falling oil and commodities prices. Thai exports were even further undermined due to the currency crisis in which the Baht was pegged to the dollar. The government quickly responded with large and important macroeconomic policy changes, including Baht depreciation, public sector financial reform and FDI promotion, implemented in the mid 1980s. Currency depreciation, relatively good infrastructure and a large pool of low-cost labour made Thailand a popular venue for FDI from Japan and the Newly Industrialising Countries (NICs), which were looking for cheap production cost locations in the late 1980s and early 1990s.

The export boom in 1986-1995 (see Table IV.2) was largely based on the presence of FDI in the export industries and on the depreciation of the currency. Export propensity is found to be higher in foreign firms than domestic firms, especially in highly export-oriented industries such as computing machines and electronic machinery (Ramstteter, 1997). High intra-firm trade among FDI firms indicates that FDI firms in Thailand also belong to MNCs' vertically integrated production networks.

2.2.3 - FDI and EOR in the ASEAN countries

The experience of ASEAN countries provides an interesting case to illustrate the relationship between FDI s and the EOR of host countries (see also Section 2.1.2). Chart IV.4 shows that in the ASEAN countries (except Indonesia before mid 1980s) increases in exports as the result of EOR implementation are closely associated with increases in the stock of FDI, especially in the post-1986 periods[34].

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[33] The material in this part is drawn from Ramstteter (1997) and Jansen (1995)
[34] See Appendix IV.6 for more details on the correlation between export and stock of FDI.

It is argued that the inflows of FDI to the manufacturing sector and the intra-firm trade strategies of multinational corporations have played an important role in the surge of manufacturing exports in the ASEAN countries since the mid 1980s (Chia, 1999). FDI firms are major exporters of textiles, garments and electronic products, which are main components of ASEAN exports. The linkage between FDI and the domestic economies, however, is weak. In all countries, exports, especially those by the foreign sector, have high import content.

Chart IV.4 - Real Export and Real Stock of FDI in the ASEAN Economies (1975-1995)

Indonesia   Malaysia

Singapore   Thailand
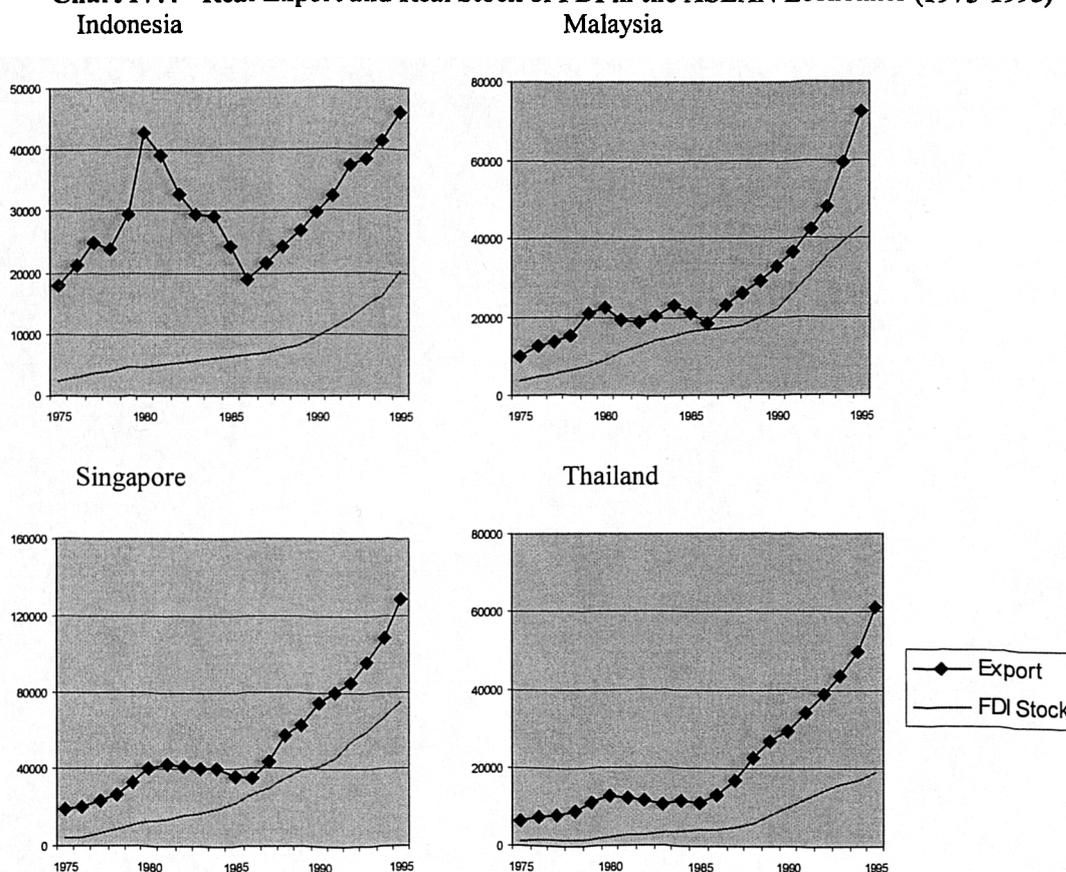
Source: Data in US dollars in 1990 prices, compiled from World Bank (2000), See Appendix IV.5 for details.

Indonesia

Indonesian manufacturing exports have been increasing substantially since 1980. From only 3% in 1981, the share of manufacturing exports in total merchandise export increased to 25% in 1987 and 51% in 1995[35]. Most notable is the rise in textiles,

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[35] Data from World Bank (2000)

garments and electronic exports, which is mainly attributed to the increase of FDI in the industries (Pangestu, 1997).

The textile and garment industries were dominated by domestic firms until the mid-1980s. Since then the inflows of FDI to the industry have increased substantially. Approved foreign investment in textiles in 1967-85 and 1986-95 were US$ 992 million and US$ 4827, respectively. The reason for the increase in FDI in textiles and garments can be attributed to the combination of low labour costs and improvements in the investment climate[36]. Along with the increase in FDI in the industry, the value of textile and garment exports increased by ten-fold during 1986-1994, and accounted for 33% of total manufactured exports in 1994. Foreign firms in the industry are more export-oriented than domestic firms. The share of exports in the total output of foreign firms in garments was 58% and 80% in 1990 and 1992, respectively, compared with that of 39% and 44% of domestic firms[37].

Exports of the electronics industry only accelerated in the early 1990s with the relocation of some large consumer-electronics firms from Japan and Korea. In 1994 the value of Indonesian's electronics export was US$ 1.5 billion, accounting for 10% of total manufactured exports. Foreign firms in this industry are also more export-oriented than domestic firms. The share of exports in the total output of foreign firms in consumer electronics increased from 6% in 1990 to 76% in 1992, compared with 6% and 41% in domestic firms, respectively. The shares of export in the total output of foreign firms in the subassembly of electronic components was 94% in 1990, compared with 26% in domestic firms[38].

The linkage between FDI firms and domestic firms is weak. Having high ratios of exports to total output, foreign firms also have high ratios of imported inputs to total inputs. The share of imported inputs in foreign firms was high in the garments industry,

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[36] Pangestu (*ibid.*)
[37] Pangestu (*ibid.*) Table 9.6

86%. In consumer electronics and subassembly of electronics components, the shares are 87% and 94%, respectively[39].

Malaysia

The export structure of Malaysia has shifted away from natural-resource-based products such as rubber to manufacturing-based outputs such as electronic products[40]. Manufacturing exports as a proportion of total exports increased from 19% in 1980 to 75% in 1995[41]. This considerable improvement in export performance may be attributed to FDI in Malaysia, which has been concentrated in the electronics and electrical industries.

From the early 1970s until the mid 1980s the Malaysian government used tariff protection and fiscal incentives to attract FDI into manufacturing exports, focusing on the electronics and electrical industries. During this period, FDI firms were located mainly in free-trade zones, used unskilled labour and had no linkages with the domestic economy. The post-1985 period is marked by the government's attempt to build up human capital stock and encourage manufacturing production and manufacturing exports toward high value-added and technological-intensive sectors. A policy of liberalisation has been adopted to attract FDI for manufacturing growth[42].

Since the mid 1980s FDI has moved away from unskilled labour-intensive production. In 1986 investment in electrical and electronic products accounted for 3% of total FDI, in 1994 the ratio increased by more than ten-fold to 33%. The increase in FDI in electrical and electronic products has contributed to considerable increases in total manufacturing production and manufacturing exports. By 1994, the output of

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[38] *Ibid.*
[39] *Ibid.*
[40] Tham and Mahani (1999)
[41] Data from World Bank (2000)
[42] Tham and Mahani (*ibid.*)

these industries accounted for 44% of total manufacturing output and 72% of manufacturing export earnings[43].

It is argued that the electrical and electronic industries in Malaysia have dualistic industrial structures. FDI firms in the sector accounted for only 22% of the total number of establishments but contributed to 80% of value added of the industries and were export-oriented. Domestic firms mainly serve the domestic market. Until the mid 1980s foreign firms imported most intermediate inputs. Since then there have been some degrees of linkage between FDI and the domestic economy in the form of local sourcing, mainly through other FDI firms established to serve the input needs of FDI firms in the electrical and electronic industries[44].

Singapore

Manufacturing exports account for a large share of the total exports of Singapore. In 1992, for example, the share of manufactured products in total exports was 77%; in 1995 it was 84%[45]. The high level of manufacturing exports is strongly linked with the level of foreign ownership and the export orientation of foreign firms. In 1992, foreign-equity capital accounted for 74% of the manufacturing sector's exports. Wholly foreign-owned firms accounted for 75% of direct export sales while wholly local-owned contributed for only 8%[46].

Electronics is the largest manufacturing industry in Singapore and it is also the main component of Singaporean exports. In the 1990s, electronic exports accounted for around half of total exports. This industry has largely been dominated by FDI firms. In 1995 the foreign-equity ratio of the industry was 88%. There were 108 wholly foreign-owned and 45 joint ventures out of a total of 247 establishments in the industry. Most of the industry exports were undertaken by foreign firms (94% in 1995), where US

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[43] Ling and Yong (1997)
[44] Tham and Mahani (*ibid.*)
[45] Data from World Bank (2000)
[46] Chia (1997)

firms accounted for 65% of the industry exports, Japanese firms for 17% and European firms for 12%[47].

Table IV.4 - The Singaporean Electronic Industries in 1992

Industry	No. of Establishment in the survey	% of foreign capital	% of sales exported	% of materials imported
Industrial electronics	63			
Computers and data-processing equipment	15	96	92	63
Disk driver	15	99	93	70
Computer peripheral equipment	20	87	90	64
Office machinery and equipment	4	99	91	57
Communications equipment	9	68	71	51
Consumer electronics	20			
TV sets and subassemblies	5	100	90	62
Microphones, loudspeakers, amplifiers	4	100	63	40
Audio-video combination equipment	11	97	80	49
Electronic components	129			
Semiconductor devices	26	84	88	94
Capacitors	8	86	70	93
Resistors	6	38	75	73
Printed circuit boards without electronic parts	22	51	38	74
Printed circuit boards with electronic parts	67	43	69	58

Source: Chia (1997) Table 2.7

The Singaporean manufacturing sector in general has high ratios of exports to total output and also a high imported inputs ratio. For all manufacturing industries, in 1992, 60% of sales were exported and 71% of materials were imported. In the industries that are dominated by foreign firms, these two ratios were high. In electronics, the export and import ratios were 81% and 66%, respectively (see Table IV.4 for details on the sub-sector of the electronics industry). In electrical machinery, they were 58% and 60%, respectively. In petroleum products they were 31% and 99%, respectively.

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[47] The website of the Ministry of Trade and Industry, Singapore: http://www.mti.gov.sg

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High export ratios reflect the small domestic market of Singapore and also the role of Singapore as an export production platform for foreign affiliates. The lack of domestic supply despite the efforts of the government to establish a local supply network through several policy tools such as the Local Industry Upgrading Program started in 1986 is partly attributed to persistently high import ratios (Chia, *ibid.*).

Thailand

Since 1986 Thailand has experienced a rapid increase in merchandise exports, which has also been accompanied by rapid growth in FDI and local investment. There was a shift in the structure of exports, with the share of non-oil manufacturing rising from 44% in 1973 to 83% in 1992. In the early 1990s the most conspicuous export growth was in office and computing machinery and electric machinery. Shares of both industries in total exports started at 0% in 1973. The share of electric machinery in exports rose to 5% in 1980 and 14% in 1992. The share of office and computing machinery was 1% in 1986 and 11% in 1992 (Ramstetter, 1997).

It is argued that FDI firms have played a large and growing role in Thai trade, especially in exports of office and computing machinery and electric machinery (Ramstetter, *ibid.*). Table IV.5 shows that the share of exports by Board of Investment (BOI)-promoted foreign firms in total non-oil manufacturing exports in Thailand rose from 12% in 1974 to 15% in 1986 and to 33% in 1990, largely due to exports in electric machinery, non-electric machinery (mainly office and computing machinery) and food. Exports of foreign firms overall increased at annual rates of 56-60% in 1986-1990 versus only 16% during 1974-1990. The share of exports by foreign firms in office and computing machinery in total exports of the industry was 74% in 1990. Foreign firms in the electric machinery exported 82% of total exports of the industry in 1992 (Ramstetter, *ibid.*).

Ramstetter also finds that foreign firms tend to depend heavily on their home markets, and the vast majority of sales and that purchases by foreign affiliates are intra-firms transactions. In his survey, intra-firm transactions accounted for 98% of all exports sales and 94% of all import purchases by the reporting firms.

Table IV.5 - Exports and Imports by BOI-Promoted Foreign Firms in Thailand (1974-1990)

Industry	Exports (current million US$)			Share of Thai exports (%)			Imports (current million US$)		
	1974	1986	1990	1974	1986	1990	1974	1986	1990
Non-oil manufacturing	151	938	5623	12	15	33	387	470	3304
Food, beverage, tobacco	27	274	865	3	12	21	35	72	206
Textiles, apparel, etc.	92	196	455	63	13	11	126	162	269
Office and computing machinery	N/A	N/A	1121	N/A	N/A	74	N/A	N/A	649
Electric machinery	1	315	1887	11	44	82	18	39	1015
Sample size (no. of establishments)	180	202	469	180	202	523	180	202	469

Source: Compiled from Ramstetter (1997)

3 – Model Specification, Methodology and Data

3.1 – Model Specification

In testing the two-way relationship between economic growth and FDI in the ASEAN countries we estimate a simultaneous-equation system of two equations: the growth equation (1) and the FDI equation (2). Based on the arguments of section 1, equation (1) models the dependence of economic growth on factors that influence demand and productive capacity; equation (2) models the dependence of growth rates of FDI on factors that influence the expected profitability of investment and confidence of investors. The expected sign of influence of each variable is in brackets. The growth rate of GDP per capita, $\Delta\ln(GDPPC)$, is used as an indicator of economic growth while the proxy for the growth of FDI is the growth rate of real FDI stock, $\Delta\ln(FDIStock)$[1]. The growth rate of GDP per capita and the growth rate of real FDI stock are two endogenous variables of the system[2].

$$\Delta\ln(GDPPC) = \alpha_0 + \alpha_1 \Delta\ln(FDIStock) + \alpha_2 \ln(Invest/GDP) + \alpha_3 \Delta\ln(ConsPC) + \alpha_4 \ln(Open)$$
$$(+) \qquad\qquad (+) \qquad\qquad (+) \qquad (+)$$
$$+ \alpha_5 \Delta\ln(Labour)) + v_1 \qquad\qquad (1)$$
$$(+)$$

$$\Delta\ln(FDIStock) = \beta_0 + \beta_1 (\Delta\ln(GDPPC) + \beta_2 \ln(GDPPC_{-1}) + \beta_3 \ln(FDIStock_{-1}) + \beta_4 \ln(OECD_{-1})$$
$$(+) \qquad\qquad (+) \qquad\qquad (-) \qquad\qquad (+)$$
$$+ \beta_5 \ln(Open)) + v_2 \qquad\qquad (2)$$
$$(+)$$

where: $\Delta\ln(GDPPC)$ is growth rate of real GDP per capita.

$(\Delta\ln(FDIStock)$ is growth rate of real FDI stock.

$\ln(Invest/GDP)$ is log of gross domestic investment as share of GDP.

$\Delta\ln(ConsPC)$ is growth rate of real consumption per capita.

$\ln(Open)$ is log of the sum of exports and imports as share of GDP. In equation (1) log of exports as share of GDP - $\ln(Export/GDP)$ - is used as an alternative for $\ln(Open)$.

$\Delta\ln(Labour)$ is growth of labour force.

$\ln(GDPP_{-1})$ is log of real GDP per capita of the previous period.

$\ln(FDIStock_{-1})$ is log of real FDI stock of the previous period.

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[1] Some empirical studies have used the ratio of FDI inflows to GDP and it is suggested that the results could be improved significantly if some proxies on FDI stocks could be built up (Balasubramanyam, 1996).

[2] See Gujarati (1995) for further details on simultaneous equation estimation.

ln(OECD$_{-1}$) is log of the sum of real GDP of 22 high-income OECD countries in the previous period. In equation (2) log of real exports in the previous period - ln(Export$_{-1}$) - is used as an alternative for ln(OECD$_{-1}$).

v$_1$ and v$_2$ are disturbances.

In equation (1) the growth of FDI stock and the growth of domestic capital stock, proxied by gross domestic investment as share of GDP[3], represent the influence of investment on economic growth. They are expected to have a positive relationship with the growth of GDP per capita because, as discussed above, increases in investment contributes to economic growth by increasing demand and productive capacity. As we assume that economic growth is influenced by domestic consumption, another element of domestic demand, the growth rate of consumption per capita is included in the model. This variable is also expected to have a positive relationship with the growth of GDP per capita. As discussed in section 1 the implementation of EOR is expected to have a positive relationship with economic growth. In this chapter we assume that levels of openness and exports reflect the implementation of EOR, and thus we alternatively use the openness degree, i.e. sum of exports and imports as a ratio of GDP, and the ratio of exports to GDP, as indicators of EOR[4]. These two variables are expected to affect the growth of GDP per capita positively. Following the practice of growth empirics we also include the growth rate of labour force into the equation.

In equation (2) the growth of GDP per capita and the level of GDP per capita in the previous period represent the influence of growth and size of the domestic market on growth of FDI. These two variables are expected to affect the growth of FDI positively. The stock of FDI in the previous period is used as an indicator of the existing stock of FDI and is expected to be a negative determinant of FDI growth. To take into account the fact that a large part of FDI in the ASEAN countries is export-oriented, we include a variable for the size of foreign market in the equation. We

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[3] Most empirical studies for developing countries have used this ratio for growth rate of capital stock, e.g. Thirlwall and Sanna (1996) and Balansubmaranyam et al. (1996)

[4] These two indicators are not included in the regression at the same time in order to avoid the problem of multicollinearity because they are highly correlated

assume that high-income OECD countries are the main exporting market of FDI firms located in the ASEAN countries[5]. The sum of the real GDP of 22 high-income OECD countries in the previous period is used as the proxy for the size of foreign market. We also use the country's exports in the previous period as an alternative proxy for the foreign market. In this equation the sum of exports and imports as a ratio of GDP is used as a proxy for the EOR. The foreign market and EOR variables are expected to have positive relationships with FDI growth

3.2 - Methodology

3.2.1 - Simultaneous-Equation Estimation

Testing the two-way relationship between economic growth and FDI discussed in Section 1 requires an empirical approach that takes into consideration the nature of this relationship. For this purpose our empirical work estimates the growth equation (1) and the FDI equation (2) in a simultaneous-equation system of two equations. The simultaneous-equation system is able to detect the interdependence between economic growth $\Delta\ln(GDPPC)$ and FDI growth $\Delta\ln(FDIStock)$[6]. This simultaneous-equation analysis also solves the endogeneity problem in equation (1) and (2). The endogeineity problem arises because the variable $\Delta\ln(FDIStock)$ in equation (1) is not exogenous; according to equation (2) it is determined by the variable $\Delta\ln(GDPPC)$. Therefore in equation (1), the variable $\Delta\ln(FDIStock)$ may be correlated with the disturbance (v_1) and in equation (2), the variable $\Delta\ln(GDPPC)$ may be correlated with the disturbance (v_2)[7]. In this case, the application of single-equation methodologies to each equation individually, e.g. Ordinary Least Square (OLS), will lead to bias and inconsistent estimates. The simultaneous-equation estimation provides unbiased and consistent

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[5] In the ASEAN countries, exports to OECD countries account for around half of total exports (ADB, various issues).
[6] See e.g. Gujarati (1995)
[7] See e.g. Davidson and MacKinnon (1993).

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results. Accordingly, Δln(GDPPC) and Δln(FDI*Stock*) are endogenous variables of the system. All other variables are assumed to be exogenous or predetermined variables[8].

3.2.2 - Two Stage-Least-Square Method

To estimate a simultaneous-equation system, the two stage-least-squares (2SLS) procedure developed by Theil (1953) and Basmann (1957) is used. This is simply to replace the endogenous variable in the right-hand side of the equation with the fitted value of that variable regressed on all the predetermined variables of the system. Using all predetermined variables of the system as instruments is recommended in regressing simultaneous equation models in order to bring unbiased and consistent estimates[9]. Both equations are over-identified[10].

3.2.3 - Simultaneous-Equation Estimation for Panel Data

The empirical work is conducted with a panel data analysis of four ASEAN countries, Indonesia, Malaysia, Singapore and Thailand for the period of 1975-1995. Pooling four countries increases the number of observations significantly, thus giving more information and more degrees of freedom, and making the regressions more efficient. The panel data analysis is also better in detecting issues that are undetectable if the time-series or cross-sectional analysis is used[11].

Consider a general model of panel data[12]:

$$y_{it} = \alpha_{it} + X_{1it}\beta_{1it} + \ldots + X_{kit}\beta_{kit} + u_{it} \qquad (3)$$

[8] Theoretically, there could be association between FDI and domestic consumption, FDI and domestic investment, and FDI and export, which might affect the assumption of exogeneity. Nevertheless such associations seem to exist between lagged FDI and the other variables, i.e. it takes FDI some time to exert influence over domestic consumption, domestic investment and exports. The FDI variable in our system is taken as growth of FDI in the present period, which validates the assumption of exogeneity of domestic consumption, investment and the trade regime. Also in this study we assume that the trade regime ultimately rest with the government's decision, thus can be regarded as an exogenous variable.

[9] Davidson and MacKinnon (1993) suggest that in a simultaneous equations model the set of all the exogenous and predetermined variables in the model is the natural choice for instruments.

[10] See Davidson and MacKinnon (1993), Greene (2000) for more details on identification.

[11] For more details on the benefits of using panel data, see Hsiao (1985, 1986) and Baltagi (1995)

[12] For more details on econometric specification for panel data see Baltagi (*ibid.*)

We have $i = 1, 2, ..., N$ cross-sectional observations and $t = 1, 2, ..., T$ time-series observations. There are $k = 1, 2, ..., K$ explanatory variables in the regression. This study uses the Fixed-Effect (FE) approach, which is based on two main assumptions:

- The intercept is allowed to vary from individual to individual but constant over time:

$$\alpha_{i1} = \alpha_{i2} = ... = \alpha_{iT} = \alpha_i$$

- The slope parameters are assumed to be constant in both individual and time dimensions.

$$\beta_{111} = \beta_{112} = ... = \beta_{11T} = ... = \beta_{1NT} = \beta_1$$

...

$$\beta_{K11} = \beta_{K12} = ... = \beta_{K1T} = ... = \beta_{KNT} = \beta_K$$

The FE approach is applied rather than the random-effect (RE) because we are focusing on a specific set of countries, i.e. the ASEAN countries. Furthermore the capability of the panel data in controlling for country heterogeneity could be enhanced when we introduce dummy variables for countries in the panel. The FE estimators also reduce specification bias, which is due to omitted variables, because the dummy variables represent country-specific effects that do not appear in the regression[13]. Since $N=4$ and $T=20$, it is feasible to apply the Least Square Dummy Variables (LSDV) estimation to estimate the regression. In the LSDV estimation, the dummy for Singapore is used as constant and three dummies for other countries are introduced into the regression[14]. The results of the Hausman test for misspecification based on Mundlak (1978)'s formula justify our decision to choose the FE rather than the RE model[15]. The use of FE panel data analysis also helps solve one problem that challenges the growth empirics, i.e. country-specific unobservable growth determinants.

Under the above assumptions, equation (3) is rewritten in matrix term:

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[13] See e.g. Baltagi (*ibid.*) and Greene (2000)
[14] This is to avoid the dummy-trap, for details, see e.g. Gajarati (1995)
[15] See Baltagi (1995) for details

$$y = D\alpha + X\beta + u \tag{4}$$

where y is NT x 1. $D = I_N \otimes \iota_T$. I_N is an identity matrix of dimension N, ι_T is vector of ones of dimension T and $\otimes$ denotes Kronecker product. In other words, D is the matrix of individual dummies that we include in the regression to estimate the α_i.

α is N x 1. X is NT x K. β is K x 1. u is NT x 1

Equation (4) is rewritten as:

$$y = A\varphi + u \tag{5}$$

where $A = [DX]$ and A is NT x $(N+K)$, $\varphi = (\alpha, \beta)$ and φ is $(N+K)$ x 1.

This model is called Least Square Dummy Variables (LSDV). Given that the classical assumptions hold, $E(u) = 0$, $E(uu') = \sigma^2 I_{NT}$ and A is the set of exogenous and predetermined variables, applying OLS on the LSDV provides Best Linear Unbiased Estimators (BLUE).

We now consider the case when some of the explanatory variables are endogenous, i.e. determined by the dependent variable. Assume that the LSDV regression (5) has m_j endogenous variables in the LSDV regression (one of them is the dependent variable and $m_j - 1$ appear in the right-hand side as explanatory variables) and $N + K_j$ exogenous and predetermined variables (N dummies and K_j exogenous variables). The dummy variables are considered as given or predetermined. Equation (5) is rewritten as follows:

$$y_j = A_j\varphi_j + Y_j\gamma_j + u_j \tag{6}$$

where y_j is NT x 1, $A_j = [DX_j]$, A_j is NT x $(N+K_j)$, φ_j is $(N+K_j)$ x 1, Y_j is NT x $(m_j - 1)$, γ_j is $(m_j - 1)$ x 1, u_j is NT x 1.

Rewriting (6), we have:

$$y_j = Z_j\delta_j + u_j \tag{7}$$

where $Z_j = [A_j Y_j] = [DX_j Y_j]$ and $\delta_j = (\alpha, \beta_j, \gamma_j)$

The classical assumptions do not hold because $E(u_j) = 0$, $E(u_j u_j') = \sigma_j^2 I_{NT}$ and the endogenous variables in the right-hand side are correlated with disturbance in each equation of the system. OLS estimators therefore are biased and inconsistent.

Cornwell et al. (1992) prove that, given the normality of the errors, the within estimator in simultaneous equations model is both the Maximum Likelihood Estimator (MLE) and the conditional MLE as in the case of single-equation estimation for FE panel data. It should be noted that if the within estimator is the LSDV estimator applied in the case in which N is large, it would reduce the degrees of freedom dramatically. If the number of individuals or N is reasonable, one can always run the regression without conducting the within transformation. In that case equation (6) should be considered as an equation of a system, which has M endogenous variables and $(N+K)$ exogenous and predetermined variables (N dummies and K_j exogenous variables). This equation can be estimated by 2SLS and the procedure is the same as the usual procedure for 2SLS, except that the instrument A includes not only K exogenous variables X but also N dummies D.

3.3 - Data Descriptions and Sources

The major sources of data are World Development Indicators CD-ROM 2000 (World Bank, 2000), International Financial Statistics (IMF, various issues) and Key Indicators of Developing Asian and Pacific Countries (ADB, various issues). Variables expressed in monetary units are in real terms of US dollars at 1990 prices. This effort to adjust data in monetary units into constant prices removes the inflation effect. Most variables are in the form of a ratio of GDP or per capita to standardise the size of the economy and population[16]. All variables are used in logarithmic form. The rate of growth is calculated as the first difference, i.e. $y_t = \log Y_t - \log Y_{t-1}$. Details of data

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[16] In the econometric analysis, this step is found to reduce the problem of heteroscedasticity significantly.

sources and compilations can be found in Appendix IV.2. Table IV.6 presents statistical features of the data.

Table IV.6 - Statistical Description of Data

Series	No. of Obs.	Mean	Std Error	Minimum	Maximum
Δln(FDI*Stock*)	80	0.129	0.062	0.029	0.279
Δln(GDPPC)	80	0.051	0.026	-0.038	0.108
ln(Invest/GDP)	84	3.464	0.205	3.143	3.881
Δln(ConsPC)	80	0.034	0.078	-0.195	0.157
ln(Open)	84	4.658	0.820	3.707	6.085
ln(Export/GDP)	84	3.970	0.823	2.910	5.372
Δln(Labour)	80	0.029	0.011	0.012	0.051
ln(GDPPC)	84	7.542	1.144	5.845	9.850
ln(FDI*Stock*)	84	9.114	0.935	7.102	11.000
ln(Export)	84	10.215	0.631	8.757	11.765
ln(OECD)	84	16.294	0.217	15.977	16.653

The growth rate of real FDI stock, Δln(FDI*Stock*) is the only proxy in the estimation that needs careful construction[17]. No other source of data on FDI stock for these countries that covers the required length of time on an annual base and at constant prices is available. The most well-known data sets for FDI stock at current prices for the countries in our sample, are the *World Investment Reports* giving 5-year interval data (UNCTAD, various issues) and *The IRM Directory of Statistics of International Investment and Production* (Dunning and Cantwell, 1987) ending in 1985[18]. Based on the argument by Kinniburgh and Ribeiro (1986) that theoretically it is possible to derive data on FDI stock conceptually by accumulating FDI inflows, annual FDI stock is accumulated from real annual FDI inflows at constant 1990 US dollars prices. The

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[17] Some empirical studies have used the ratio of FDI inflows to GDP e.g. Balasubramanyam (1996, 1999) and the researchers have also admitted that the results could be improved significantly if some proxies on FDI stocks could be built up. It is also argued that although data on FDI inflows and stocks cannot reveal the full size and scale of MNCs activities in the recipient economies, it is still the most available and reliable for empirical studies (see e.g. Stephan and Pfaffmann, 2001/2).

[18] Minor variations, however, were found when our constructed dataset at current prices was compared with these two sets when possible.

dataset starts from 1970 with the assumption that the inflows of FDI to the four ASEAN countries before 1970 are rather insignificant. Accordingly, the data set on annual FDI stock at constant prices for the period 1970-1995 is built up.

3.4 - Some Econometric Issues

3.4.1 - The Problem of Stationarity and Spurious Regressions

Because the data used in this study is macroeconomic time series, an issue that naturally arises is that the series involved might not be stationary. If not, unless they are cointegrated, there may be a unit root in the error terms and the standard hypothesis testing would be invalid due to the spurious problem[19]. The well-known procedure to tackle this problem is to conduct unit root tests, and then cointegration tests, if variables are found nonstationary, and finally estimate the regressions in error-correction form.

For our panel data, unit root tests must be conducted for each variable at the country-specific level with twenty-one (21) observations per variable. Results of the Dickey-Fuller test suggest that among all series in our analysis, some are integrated at order one ($I(1)$) and some are at order two ($I(2)$). These findings however are less than reliable and should be treated with caution because the power and size of the unit root test may be poor in finite samples like ours. Specifically, a unit root test for a series, which falsely rejects the null hypothesis of stationarity, may be properly indicating that the series should be treated as stationary for purposes of finite sample inference[20]. The implementation of the test for cointegration bears a similar problem.

To continue with the estimations, we assume that there is no spurious problem in our regressions. This assumption seems valid because the series in our estimations do not display graphically deterministic trend behaviour, suggesting the absence of unit roots.

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[19] See for details Gujarati (1995) and Harris (1995)
[20] See Harris (1995) for more details.

3.4.2 - Testing for Autocorrelation

In order to test for autocorrelation in simultaneous-equation panel data estimation, a test procedure should consider the correlation of the residuals of each equation and the correlation of the residuals across equations. The existing tests in the literature, which take into account only one dimension of the issue, such as Harvey and Phillips (1980) exact test for simultaneous equations models, and Bhargava et al. (1982) and Baltagi's (1995) tests for the fixed-effect model, are inapplicable in our model. Moreover these tests for panel data are normally based on the assumption that typical panel data contains large individual observations and small time observations. For example the critical values in the Bhargava et al. (*ibid.*) test are calculated for samples of N=50, 100, 150 and T=6, 10. Thus it is meaningless to conduct any of the existing tests for autocorrelation while they have irrelevant critical values.

Our simultaneous-equation system with two equations is therefore estimated under the assumption that the errors from the two equations are dependent, or there is no autocorrelation in the regression. This is supported by the implicit assumption in the 2SLS estimation that the disturbances in our two structural equations are not contemporaneously correlated.

4 - Results and Interpretations

This section presents estimation results for the four ASEAN countries during 1975-1995 based on the model specification in Section 3.1. We use the simultaneous-equation regression for fixed-effects panel data described in Section 3.2. The Hausman simultaneity test is also carried out to check the simultaneity, i.e. interdependence between the two dependent variables of the two equations in the system. This test is essential because if the two-way relationship exists, or if there is simultaneity between economic growth and FDI, we should estimate the equations with a simultaneous

equation method. The single-equation method in this circumstance provides inconsistent and inefficient estimators. However if there is no interdependence and we apply the simultaneous-equation method, the yield estimators are consistent but not efficient[21]. Results of the Hausman simultaneity test indicate that we do not reject the hypothesis that simultaneity is present in the estimation.

Our findings are strongly consistent with the main hypotheses. Tables IV.7 and IV.8 report the estimation results of equations (1) and (2) respectively. There are seven specifications, controlling for different explanatory variables. In each table, the first part reports the coefficients and t-statistics of explanatory variables. The second part reports the coefficients and t-statistics of dummy variables. The last part shows results of diagnostic tests. Correlation matrixes of variables in the regressions are reported in Appendix IV.7.

Most variables have statistically significant coefficients with the expected signs. Results from tables IV.7 and IV.8 do not reject the first hypothesis that there exists a two-way relationship between economic growth and FDI. Growth of real FDI stock is an important determinant of growth of GDP per capita (table IV.7). Growth of real GDP per capita is also significantly and positively related to growth of real FDI stock (table IV.8). We also find that EOR plays an important role in this two-way relationship. When variables that represent EOR are excluded from the growth equation - Specifications (1) and (2) - inward FDI exerts no significant impact on growth, and thus there is no interdependence between economic growth and FDI. When we re-estimate the simultaneous-equation system for two sub-periods, 1975-1985 and 1986-1995, we find that in 1975-1985, the two-way relationship between FDI and economic growth is weak and mostly insignificant. During 1986-1995, when the ASEAN countries actively pursued the export-led and FDI-led growth strategy, this relationship

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[21] See e.g. Hausman (1976), Gujarati (1995)

becomes strong and significant. These findings confirm the second hypothesis that EOR played a crucial role in the two-way relationship between economic growth and FDI in the ASEAN countries.

The White and Breusch-Pagan tests are used to detect the problem of heteroscedasticity in the estimation. The tests provide similar results, i.e. the null hypothesis that heteroscedasticity is not present in the system is not rejected. Other supporting evidence is that the White heteroscedasticity-consistent estimates and the results estimated without the robust-errors syntax are not significantly different, indicating that heteroscedasticity is not a problem in the estimation[22]. In any cross-country regression, heterogeneity across countries is always a big concern. The fact that our estimations do not suffer from this problem might be largely due to the introduction of dummy variables in the regression (see Section 3.2.3). In the growth and FDI equations, results of the test for joint significance of dummy variables reject the null hypothesis that the country-specific effects are equal.

The Hausman misspecification test is used to detect the problem of misspecification, and to verify the choice of fixed-effects over random-effects. We apply the procedure developed by Mundlak (1978) for the Hausman test[23]. The test results reject the null hypothesis that there is misspecification in the estimation and justify the application of the fixed-effect model.

4.1 - Determinants of Economic Growth

Table IV.7 shows the Two-Stage-Least-Square simultaneous-equation fixed-effects panel data estimation of the growth equation. The dependent variable is the growth rate of real GDP per capita. Growth of real stock of FDI, growth of consumption per capita and EOR are found to be the main determinants of GDP per capita growth. Positive coefficients of FDI in all specifications suggest that growth of

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[22] This is suggested by Wallace and Silver (1988).
[23] See Baltagi (1995) for more details

the real stock of FDI could make some contribution to host country economic growth. Nevertheless FDI growth has positive and significant coefficients only when a variable that represents EOR, either the openness degree or the share of exports in GDP, is introduced into the regression. Our findings suggest that growth of FDI stock contributed to the economic growth of the ASEAN countries when EOR was implemented. This is consistent with the results from a study by Balasubramanyam, Salisu and Sapsford (1996) that FDI is a potent driving force in the growth process of Export-Promoting countries and it exerts no significant influence upon growth of Import-Substituting countries. It is also consistent with the proposition that some other large FDI recipients such as Latin America lagged behind East Asian countries in promoting high growth and attracting DFI due to the absence of, *inter alia*, policies for export-led and FDI-led growth (Nunnenkamp, 1997). Our results are also consistent with the findings of Nair-Reichert and Wienhold (2001) that there is a causal relationship from FDI to growth that seems to be stronger in more open economies. Both proxies for the openness variable, the degree of openness (Open) and the share of export in GDP (Export/GDP), have highly significant and positive coefficients[24]. Accordingly, our results suggest that FDI and EOR contributed to the economic growth of the ASEAN countries by improving export performance.

Our findings about the role of FDI and EOR in the economic growth of the ASEAN countries are not consistent with the existing literature about sources of growth in these countries[25]. Collins and Bosworth (1996), for example, claim that the extraordinary growth of East Asian countries, including the four ASEAN countries, and Korea, Philippines and Taiwan, has been driven by factor accumulation while gains in technological progress have been modest; this outcome is not encouraging for the view that this performance reflects the benefits of trade openness. As FDI is often seen as a

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[24] These two proxies do not appear at the same time in the growth equation to avoid the multicollinearity problem because they are highly correlated (see Appendix IV.7).
[25] See Collins and Bosworth (1996) and their references.

means of technology transfer, such findings about modest effect of technology progress also seems to question the technological contribution of FDI and thus the effectiveness of FDI promotion strategies in these countries. The empirical findings of this chapter, however, confirm the hypothesis that FDI and higher degrees of openness resulting from EOR, including increases in exports, play critical parts in the economic growth of the ASEAN countries. Although this chapter does not detect the direct link between FDI and technological progress, the fact that in the ASEAN countries during 1985-1995 FDI increased rapidly along with higher economic growth and a surge in manufacturing exports dominated by FDI firms, especially in relatively more technological-intensive industries such as electronics and electrical goods, suggests the association between FDI and technological progress exists. Our view is supported by a closer look at the findings of Collins and Bosworth (1996), a distinctive study that carefully estimates sources of growth in East Asian countries. According to their estimate[26], Total Factor Productivity (TFP) growth accounted for more or less one fourth of the growth in output per worker between 1960 and 1994 in Indonesia, Malaysia and Singapore and for one third in Thailand. These are, however, the averages over more than three decades. Between 1973 and 1984, TFP growth accounted for 11% of growth in Indonesia and Malaysia; during 1984-1994 it was 24% in Indonesia and 36% in Malaysia. During 1984-1994, TFP growth accounted for around half of output growth in Singapore and Thailand, compared with 23% in Singapore and 30% of growth in Thailand during 1973-1984. According to this study, the period when TFP growth contributed the most to output growth in the ASEAN countries was 1984-1994. This is the period in which FDI and EOR were largely promoted.

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[26] See Appendix IV.8

There seem however to be several problems with FDI-led and export-led growth in these countries. The presence of foreign firms in the ASEAN countries has created the so-called dualistic industries, especially in the electronics and electrical products sector, where foreign firms, though small in terms of number of establishments, have much more advanced technologies and dominate the value added and export shares of the industries. Most domestic firms are small- and medium- sized with laggard technologies, mainly serving the local market (Thomsen, 1999 and Chia, 1999). Improvements in export performance in the ASEAN countries tend to be attributed to FDI firms, which are the dominating players in some main export categories, especially manufacturing exports. The less prominent role of the domestic sector in the export-led and FDI-led growth of these countries could, to some extent, explain the insignificant impact of domestic investment as a share of GDP, a proxy for the growth of domestic capital stock in all specifications. Our finding that FDI has a large positive impact on economic growth while domestic investment has no significant impact is consistent with the findings of Balasubramanyam et al. (1996). This is inconsistent with most studies in the growth literature, which exclude the trade or openness variable. When a proxy for this variable is included, the coefficients for domestic capital stock tend to become insignificant (see results of Balasubramanyam et al., 1996 and 1999 and Thirlwall and Sanna, 1996). This insignificant impact of domestic capital stock on growth might be attributed to the significant impacts of FDI and open variables. This might also suggest that the impact of FDI on domestic investment is limited and that the presence of FDI exerts no impacts on the contribution of domestic capital to economic growth. Our results seem consistent with the findings of some studies, which suggest that FDI has higher growth effects than domestic capital (see e.g. Balasubramanyam et al., 1996, 1999; Oliva and Rivera-Batiz, 2002).

Growth of consumption per capita has a positive and significant relation with economic growth, which is consistent with our hypothesis that growth is demand-driven. However we do not have enough evidence from the estimation to tell whether FDI contributes to growth through raising domestic consumption. Following the existing growth empirics we introduce a labour variable in the growth equation. In a traditional Cobb-Douglas production function, labour is an important factor of production and the growth of labour is hypothesised to be positively related to economic growth[27]. In our sample, the growth rate of the labour force does not have significant impacts on economic growth. This indicates that in the ASEAN countries during 1975-1995 the quantity of the labour force might not be important in promoting high economic growth. Observations about human capital development and productivity improvement in the ASEAN countries (Hill and Athukurala, 1998 and Chia, 1999) suggest that the quality of labour - rather than the quantity - could be influential in the growth process. This issue will be discussed in details in the next Chapter.

4.2 – Determinants of FDI

Table IV.8 shows the Two-Stage-Least-Square simultaneous-equation fixed-effects panel data estimation of the FDI equation. The dependent variable is the growth rate of the real stock of FDI. Our results show that growth of real GDP per capita is an important determinant of FDI growth. The coefficients of this variable are highly positive and statistically significant in all specifications. Our result is consistent with the finding of Jackson and Markowski (1994) that high economic growth is the most prominent factor that attracts FDI to the Asian and Pacific countries. This also confirms the finding of Goldar and Ishigami (1999) that FDI from Japan has moved from utilising cheap labour in Asia for the production of exports to the U.S. and EU markets

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[27] See e.g. Balasubramanyam et al. (1996)

to taking advantage of growing Asian markets and producing final consumer goods for these markets. We find that growth of GDP per capita exerts a significant impact on FDI growth regardless of the appearance of the openness variable, which is consistent with the proposition in Section 1 that a country with a high economic growth rate could attract FDI with or without the presence of EOR policy; however along with high economic growth, EOR enhances the attractiveness of a country for FDI. The coefficients of GDP per capita in the previous period are positive and highly significant but smaller than those for GDP per capita growth. This indicates that the growth and size of the domestic market are important determinants of inward FDI but the former seems to have the larger impact. This is consistent with the argument of section 1, which emphasises that economic growth is not only a signal of a growing domestic market, which is important for market-seeking investors, but also an indicator of some level of development, which is of interest for both market-seeking and efficiency-seeking investors.

Results of Specifications (5), (6) and (7) show that both proxies for the size of foreign markets have no significant impacts on growth of inward FDI. This reflects the globalised production strategy of multinational corporations and the position of FDI firms located in these ASEAN countries in the global production chain, where intra-firm trade rather than direct trade plays a dominant role (see Hill and Athukurala, 1998). The openness variable, on the other hand, has a statistically significant and positive impact on the growth of FDI. Our results indicate that although the location decision for FDI might be unrelated to the size of foreign market the implementation of EOR in host country is of paramount importance. This is consistent with the findings of Singh and Jun (1995) that export orientation is the strongest variable in explaining why a country attracts FDI.

The coefficients for the existing stock of FDI are highly significant and have the expected negative sign in all specifications, which strongly supports our hypothesis that existing stock of FDI adversely influences the growth of FDI. Our finding however is not consistent with the results of some other studies that the existing stock of FDI in a country has a positive and statistically significant impact on new FDI[28]. As a considerable part of FDI inflows serve the domestic market of the ASEAN countries the negative relationship between existing FDI and the growth of FDI stock might indicate that the domestic market was still rather limited. It might also indicate that the infrastructure, human resources and other supporting facilities in these countries constrained their absorptive capacity for new FDI. Singapore and Malaysia, for example, have experienced shortages of relatively cheap skilled labour and rising wages, and thus have turned away investors seeking a cheap labour force.

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[28] For example Wheeler and Mody (1992); Jackson and Markowski (1994); Mody and Srinivasan (1996); Head and Ries (1996); Chen C. L. (1997a, b); Cheng and Kwan (2000), for more details see Chapter II.

Table IV.7 - Economic Growth, FDI and Trade Regime: GROWTH EQUATION

Dependent Variable: Growth Rate of Real GDP Per Capita

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ln(Invest/GDP)	0.012	0.010	-0.025	-0.024	-0.020	-0.026	-0.028
	(0.75)	(0.62)	(1.13)	(1.05)	(1.04)	(1.32)	(1.43)
Δln(FDIStock)	0.068	0.094	0.144	0.137	0.143	0.192	0.205
	(0.89)	(1.17)	(1.98)*	(1.74)*	(1.97)*	(2.49)**	(2.85)***
Δln(ConsPC)	0.174	0.172	0.139	0.142	0.134	0.123	0.119
	(5.51)***	(5.07)***	(4.18)***	(3.96)***	(4.02)***	(3.41)***	(3.51)***
ln(Open)			0.037	0.037			
			(2.05)**	(2.02)**			
ln(Export/GDP)					0.039	0.042	0.042
					(2.50)**	(2.64)**	(2.67)***
Δln(Labour)		0.097		0.063		0.030	
		(0.43)		(0.28)		(0.14)	
DUM-INDO	-0.001	-0.0005	0.063	0.063	0.065	0.071	0.071
	(0.14)	(0.06)	(1.95)*	(1.94)*	(2.36)**	(2.50)**	(2.53)**
DUM-MALAY	-0.004	-0.004	0.029	0.029	0.031	0.034	0.034
	(0.66)	(0.64)	(1.64)	(1.62)	(1.98)*	(2.12)**	(2.15)**
DUM-THAI	0.006	0.007	0.068	0.068	0.074	0.080	0.081
	(0.99)	(1.01)	(2.21)**	(2.20)**	(2.67)***	(2.79)***	(2.81)***
R^2	0.437	0.438	0.463	0.458	0.480	0.450	0.447
t-value(Hausman)[a]	1.606	1.558	2.055**	1.979*	1.735*	1.912*	3.039***
F-value[b]	1.791	1.842	2.785**	2.757**	3.297**	6.234***	5.108***
χ^2(Hausman)[c]	994.2***	282.02***	388.25***	149.93***	11.043**	13.752***	1024.0***
χ^2(White)[d]	9.598	9.908	14.603	15.825	15.746	18.230	16.146
χ^2(BP)[e]	7.716*	5.675	4.131	4.076	5.583	1.397	0.600

Note: absolute value of t-statistics in parentheses; *, **, ***: statistically significant at 10, 5 and 1 %. Regression is estimated with robusterror syntax to control for autocorrelation.

[a]: Hausman test for simultaneity effect: The hypothesis of a simultaneous effect is not rejected if t-value is significant.

[b]: F-test for joint significance of dummy variables: The hypothesis of unequal unobserved country-specific effects is not rejected if F-value is significant.

[c]: Hausman test for misspecification: The hypothesis of correlation between the individual effects and the explanatory variables, or the regression is not misspecified, is rejected if the chi-square value is significant.

[d]: White test for HS: The hypothesis of no heteroscedasticity is rejected if the chi-square value is significant.

[e]: BP test for HS: The hypothesis of no heteroscedasticity is rejected if the chi-square value is significant. When the problem of heteroscedasticity appears, the robusterrors estimation is reported.

Table IV.8 - Economic Growth, FDI and Trade Regime: FDI EQUATION

Dependent Variable: Growth of Real Stock of FDI

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ln(FDIStock(-1))	-0.142	-0.155	-0.155	-0.145	-0.158	-0.140	-0.054
	(3.07)***	(3.50)***	(3.50)***	(3.09)***	(3.89)***	(3.03)***	(2.64)***
Δln(GDPPC)	1.556	1.125	1.131	1.531	0.959	1.446	1.162
	(3.88)***	(2.63)***	(2.64)**	(3.90)***	(2.50)**	(2.61)**	(2.18)**
ln(GDPPC(-1))	0.314	0.318	0.318	0.302	0.325	0.291	
	(2.55)**	(2.73)**	(2.73)***	(2.41)**	(3.03)***	(2.03)**	
ln(Open)		0.089	0.089		0.099		
		(1.88)*	(1.87)*		(2.65)**		
ln(OECD(-1))						0.028	0.128
						(0.28)	(1.49)
ln(Export(-1))				0.014			
				(0.44)			
DUM-INDO	0.793	0.972	0.971	0.762	1.009	0.727	-0.072
	(2.42)**	(3.00)**	(2.99)***	(2.28)**	(3.23)***	(1.84)*	(2.60)**
DUM-MALAY	0.497	0.596	0.596	0.486	0.617	0.459	-0.017
	(2.50)**	(3.06)**	(3.05)***	(2.44)**	(3.29)***	(1.95)*	(0.93)
DUM-THAI	0.505	0.664	0.663	0.489	0.695	0.458	-0.083
	(2.31)**	(2.97)**	(2.97)***	(2.22)**	(3.11)***	(1.70)*	(2.77)***
R^2	0.289	0.363	0.363	0.285	0.372	0.297	0.300
t-value (Hausman)[a]	1.606	1.558	2.055**	1.979*	1.735*	1.912*	3.039***
F-value[b]	3.463**	5.680***	5.645***	3.790**	5.444***	5.055***	9.699***
χ^2(Hausman)[c]	225.2***	34.29***	46.48***	41.59***	42.007***	47.33***	35.24***
χ^2(White)[d]	8.780	16.793	16.924	15.342	18.273*	10.282	7.851
χ^2(BP)[e]	2.028	4.728	4.728	4.004	6.214	1.275	2.367

Note: See Table IV.7

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4.3 - Two-way Relationship between FDI and Economic Growth in Two Sub-Periods, 1975-1985 and 1986-1995

The economic performance of the ASEAN countries in the two sub-periods, 1975-1985 and 1986-1995 is different (see Section 2.1.5). The second period is marked by the extensive implementation of pro-FDI and EOR in all the countries. FDI in the second period increased at a higher rate than in the previous one. Export performance was also improved substantially.

To examine the effect of time on the two-way relationship between FDI and economic growth, we re-estimate the simultaneous-equation system for each sub-period. Results are shown in Tables IV.9 and IV.10 for 1975-1985 and in Tables IV.11 and IV.12 for 1986-1995. During 1975-1985, although the impact of FDI on growth is positive and statistically significantly (Table IV.9), economic growth is not a significant determinant of growth of FDI (Table IV.10). The result indicates that the two-way relationship between FDI and economic growth is small and insignificant in this period. During 1986-1995, the two-way relationship becomes strong and significant. FDI is a positive and significant factor in promoting growth (Table IV.11) and economic growth affects FDI positively and significantly (Table IV.12).

These findings confirm the hypothesis that EOR strengthens the two-way relationship between economic growth and FDI. In the period 1975-1985, without an extensive implementation of EOR, this relationship seems weak and insignificant. On the contrary, in 1986-1995 when the ASEAN countries actively launched export-led and FDI-led growth policies, high economic growth was promoted and large amounts of FDI were attracted, leading to strong interdependence between economic growth and inward FDI.

Table IV.9 - Economic Growth, FDI and Trade Regime (1975-1985): GROWTH EQUATION

Dependent Variable: Growth Rate of Real GDP Per Capita

	(3)	(4)	(5)	(6)	(7)
ln(Invest/GDP)	0.002	-0.001	-0.027	-0.028	-0.026
	(0.04)	(0.03)	(0.84)	(0.87)	(0.79)
Δln(FDIStock)	0.373	0.381	0.275	0.366	0.325
	(2.38)**	(2.58)**	(2.02)**	(2.46)**	(2.10)**
Δln(ConsPC)	0.068	0.065	0.09	0.067	0.078
	(1.16)	(0.92)	(1.90)*	(1.32)	(1.62)
ln(Open)	-0.047	-0.046			
	(0.73)	(0.67)			
ln(Export/GDP)			0.021	0.014	0.018
			(0.54)	(0.31)	(0.41)
Δln(Labour)		-0.148		-0.169	
		(0.32)		(0.49)	
R^2	0.018	0.003	0.205	0.025	0.113

Table IV.10 - Economic Growth, FDI and Trade Regime (1975-1985): FDI EQUATION

Dependent Variable: Growth of Real Stock of FDI

	(3)	(4)	(5)	(6)	(7)
ln(FDIStock(-1))	-0.089	-0.144	-0.004	-0.082	-0.046
	(1.09)	(1.01)	(0.07)	(0.78)	(1.66)*
Δln(GDPPC)	1.347	1.984	0.158	1.366	1.134
	(1.35)	(1.39)	(0.25)	(1.08)	(1.31)
ln(GDPPC(-1))	0.157	0.374	-0.229	0.140	
	(0.51)	(0.60)	(0.93)	(0.33)	
ln(Open)	0.167		0.238		
	(1.67)*		(2.80)**		
ln(OECD(-1))				0.129	0.159
				(0.68)	(1.17)
ln(Export(-1))		0.028			
		(0.28)			
R^2	0.373	0.190	0.498	0.344	0.385

Table IV.11 - Economic Growth, FDI and Trade Regime (1986-1995): GROWTH EQUATION

Dependent Variable: Growth Rate of Real GDP Per Capita

	(3)	(4)	(5)	(6)	(7)
ln(Invest/GDP)	-0.029	-0.028	-0.025	-0.030	-0.031
	(0.84)	(0.81)	(0.95)	(1.13)	(1.16)
Δln(FDI$Stock$)	0.242	0.241	0.188	0.226	0.222
	(3.57)***	(3.48)***	(3.88)***	(3.70)***	(3.74)***
Δln(ConsPC)	0.049	0.055	0.068	0.061	0.057
	(1.08)	(1.06)	(1.82)*	(1.21)	(1.28)
ln(Open)	0.022	0.021			
	(0.58)	(0.56)			
ln(Export/GDP)			0.032	0.037	0.037
			(0.91)	(0.99)	(1.01)
Δln(Labour)		0.073		0.073	
		(0.40)		(0.41)	
R^2	0.516	0.615	0.683	0.646	0.649

Table IV.12 - Economic Growth, FDI and Trade Regime (1986-1995): FDI EQUATION

Dependent Variable: Growth of Real Stock of FDI

	(3)	(4)	(5)	(6)	(7)
ln(FDI$Stock$(-1))	-0.136	-0.087	-0.078	-0.077	-0.056
	(1.00)	(0.83)	(0.57)	(0.82)	(1.03)
Δln(GDPPC)	2.816	3.135	3.504	2.792	2.831
	(2.33)**	(2.91)***	(2.85)***	(2.55)**	(2.56)**
ln(GDPPC(-1))	0.272	0.094	0.166	0.050	
	(1.03)	(0.25)	(0.62)	(0.23)	
ln(Open)	0.071		0.030		
	(0.71)		(0.29)		
ln(OECD(-1))				0.231	0.240
				(1.10)	(1.24)
ln(Export(-1))		0.048			
		(0.29)			
R^2	0.345	0.439	0.398	0.490	0.486

4.4 - Economic Growth, FDI and Overall Economic and Social Environment

The role of the economic and social environment in the growth process and in attracting FDI has been well recognised in the literature. Kalecki (1970), for example, postulates that the institutional framework of a social system is a basic element of its economic dynamics. In our theoretical framework, although we show that EOR is a necessary but not sufficient condition for the existence of this relationship, it should be noted that the overall economic and social environment and government commitment to growth are also important factors. For instance the launch of supporting policies such as the improvement of the physical and social infrastructure needed to develop the export sector and linkages between FDI and the domestic economy, is important for FDI to contribute to economic growth. Although we cannot estimate the impact of the overall economic and social environment in the two-way relationship between FDI and economic growth due to the lack of data, there is some evidence from other studies regarding this issue. Hill and Athukurula (1998) and Chia (1999) attribute pro-growth and FDI-favourable environments to the success of the ASEAN countries in attracting FDI. A study by Kindra, Strizzi and Mansor (1998) suggests that the ASEAN countries have attracted foreign investors based on their enhanced international standing as a profitable and internationally competitive region. More specifically, Ermisch and Huff (1999) find that public polices to attract footloose foreign capital and raise investment levels have promoted exports and the driven hyper-growth of Singapore. Meanwhile Thee (2001) suggests that Indonesia has not been successful in taking advantage of FDI to promote its indigenous industrial technological capabilities due to weaknesses and inefficiencies in the regulatory framework, especially relating to FDI and human capital development.

5 - Conclusion

This chapter has built up a theoretical framework for studying the relationship between economic growth and FDI, which hypothesises that there is a two-way relationship between FDI and economic growth. FDI could contribute to the economic growth of a host developing country by generating demand and improving the productive capacity. High economic growth could improve profitability and the confidence of investors, thus attracting more FDI. The framework also hypothesises that the two-way relationship between FDI and economic growth could be strengthened by the implementation of an Export-Oriented Regime (EOR), which encourages exports by providing favourable terms for export-oriented production and by reducing import barriers for inputs for export production. With the implementation of EOR, a country could attract more FDI, especially export-oriented FDI, and the contribution of FDI to economic growth, especially through generating foreign demand, can be improved.

Results from the simultaneous-equation estimation for fixed-effects panel data find that there was a two-way relationship between FDI and high economic growth in four ASEAN countries during 1975-1995: FDI was an important growth-enhancing factor and high economic growth was a positive determinant of FDI. The implementation of EOR strengthened this relationship: without controlling for a variable representing EOR the relationship between economic growth and FDI become insignificant. Besides growth of FDI stock, growth of domestic consumption and the implementation of EOR are the other key determinants of economic growth. Our study suggests that FDI contributed to the economic growth of the ASEAN countries through its impacts on exports and on technological progress. The growth and size of the domestic economy and the implementation of EOR affect the growth of FDI stock

positively while the existing stock of FDI in the host country is negatively related to FDI stock growth.

This chapter has made two contributions to the existing literature. *First*, it provides a framework for studying the existence and mechanism of the two-way relationship between economic growth and FDI, which has largely been ignored in the literature. As there are very few comprehensive empirical studies about the ASEAN countries considering their roles as large FDI recipients, the *second* contribution of this chapter is its analysis of economic growth and FDI in the four ASEAN countries. To do so, the empirical study of this chapter develops a procedure to estimate a simultaneous-equation system for panel data. The advantage of this procedure is that it enables the study to detect the two-way relationship between economic growth and FDI for a panel of data for the four countries.

The empirical work of this chapter has some limitations despite the advanced econometric techniques that it applies. *First*, in the FDI equation although high economic growth is found to be positively associated with FDI, there is no evidence as to whether high economic growth influences the growth of FDI stock by enhancing profitability or raising the confidence of investors or both. *Second*, the study is unable to investigate the role of the overall social and economic environment in this relationship between FDI and growth due to lack of data. Since the process of promoting FDI and economic growth is closely associated with production, knowledge and technologies, the stock of human capital, *inter alia*, in the host country could be critical. Recognising the importance of this issue, the next chapter will consider the role of human capital in the relationship between economic growth and FDI.

Chapter V - Human Capital, Economic Growth and Foreign Direct Investment: Evidence from Four ASEAN countries

Introduction

The previous chapter presents a theoretical framework, which postulates that there could be a two-way relationship between FDI and the economic growth of the host country. Since FDI and economic growth are closely associated with production, knowledge and technologies, the stock of human capital in the host country could play an important role in the relationship between FDI and economic growth. Although some studies have highlighted the role of human capital as a condition for FDI to contribute to growth, the issue is approached mainly from the empirical angle. For example an influential study by Borensztein, De Gregorio and Lee (1998) argues that FDI contributes to economic growth by reducing the costs of introducing new varieties of capital goods. Empirically, they cannot find a significant impact of FDI on economic growth and thus introduce human capital into the regression in the form of an interaction with FDI. This interaction is found to have a significantly positive impact on growth and they conclude that a country should reach a certain level of human capital in order for FDI to have effects on growth. How human capital could influence this relation between FDI and economic growth is ignored.

The objective of this chapter therefore is to investigate the role of human capital in the relationship between economic growth and FDI. A theoretical framework is developed i) to examine whether and how human capital in the host country could influence the impacts of FDI on economic growth; and ii) to analyse the interaction between economic growth and human capital in attracting FDI. This theoretical framework hypothesises that human capital is a positive factor that facilitates the two-way relationship between economic growth and FDI. Empirical work is carried out to

test the hypotheses in four ASEAN countries - Indonesia, Malaysia, Singapore and Thailand - during 1975-1995. The empirical work applies simultaneous-equation estimation for fixed-effect panel data.

The contribution of this chapter to the existing literature is twofold. *First* it draws a theoretical framework that examines the channels through which human capital influences the two-way relationship between growth and FDI. *Second* it assesses the impacts of human capital on the relationship between growth and FDI in the ASEAN countries during 1975-1995 using different indicators of human capital. This study does not use indicators that have been used in the empirical literature (such as secondary school enrolments) because these have been criticised as poor indicators of human capital. It calculates public spending on education and labour productivity in the ASEAN countries and uses these as indicators for human capital as they might be more meaningful measures of human capital in the context of these countries. This study also uses another indicator of human capital constructed by Bosworth and Collins (1994), which weights education attainment with earnings of different educational groups.

The rest of this chapter is structured as follows: Section 1 presents the theoretical arguments and hypotheses about the role of human capital in the relationship between economic growth and FDI. Section 2 discusses human capital development in the four ASEAN countries. Section 3 presents the model specifications and data sources. Section 4 empirically investigates the role of human capital in the relationship between economic growth and FDI in the ASEAN countries during 1975-1995. Section 5 concludes the chapter.

1 - Theoretical Framework

This section draws a theoretical framework to study the role of human capital in the relationship between economic growth and FDI, based on the framework developed

in Chapter IV. Our theoretical arguments show that human capital improves the contribution of FDI to economic growth and in supporting high economic growth, attracts FDI. It is hypothesised that human capital is a positive factor that facilitates the two-way relationship between growth and FDI.

This theoretical framework is comprised of four parts. First, the model of the two-way relationship between growth and FDI is briefly summarised. Second, the impacts of human capital on economic growth and on the contribution of FDI to growth are examined. Third, the role of human capital in attracting FDI and its interaction with high economic growth in inducing FDI are analysed. With the Export-Oriented Regime (EOR) hypothesised to be a necessary condition for the existence of the two-way relationship (Chapter IV), the last part of the theoretical discussion examines the interaction between the trade regime and human capital in influencing the two-way relationship between growth and FDI.

1.1 - An Overview of the Model of the Two-way Relationship between Economic Growth and FDI

Chapter IV of this thesis has sketched a framework of the two-way relationship between economic growth and FDI in developing countries. Graph IV.1 depicts this relationship. There are two directions of influence. Direction A is from FDI to growth. Following the Keynesian-Kaleckian tradition, this framework proposes that the economic growth of a developing country is driven by domestic and foreign demand for its products and is constrained by its productive capacity. FDI could contribute to economic growth through three channels: by generating domestic demand (A1) and foreign demand (A2), and by improving the productive capacity of the country (A3). FDI could raise domestic demand when it has influence over two main components of domestic demand, i.e. domestic consumption and domestic investment. FDI raises domestic consumption when it creates employment and generates income. FDI raises

domestic investment when it acquires inputs domestically. FDI, especially export-oriented FDI, could also boost foreign demand for the country's products because foreign firms have internationally recognised brand names, established marketing channels and knowledge about consumer tastes in export markets. FDI could improve the country's productive capacity by bringing in technology, capital equipment and entrepreneurial skills.

The second direction of influence is Direction B - from economic growth to FDI. FDI is likely to be attracted to a country with high economic growth. Economic growth is a crucial factor influencing the growth of sales to the domestic market (B1), cost factors (B2) and confidence about the future (B3), which under the Keynesian and Kaleckian approach are key determinants of FDI. A rapidly growing economy provides a relatively better opportunity for making profits and a higher expected growth of sales than one that is growing slowly or not growing at all. High economic growth rates could also indicate a certain level of infrastructure development, which is cost beneficial for investors and signals a country's good development potential, thus enhancing the confidence of foreign investors.

The implementation of an Export-Oriented Regime (EOR), as postulated in this framework, plays a significant role in the two-way relationship between economic growth and FDI. EOR vigorously encourages firms to produce for exports by offering various incentives and reducing trade barriers. EOR, therefore, could influence cost factors positively (B2) and boost the confidence of foreign investors by signalling the pro-growth and pro-business commitment of government (B3), thus inducing more FDI, especially export-oriented FDI. By encouraging FDI firms to export, EOR could enhance the positive impacts of FDI on domestic and foreign demand (A1 and A2) and productive capacity (A3), and thus on economic growth. EOR plays a vital role, being a necessary condition for the existence of the two-way relationship between growth and

FDI. Without EOR, a small domestic market, where the majority of the population have low incomes, constrains the contribution of FDI to growth and the amount of FDI that a country could attract.

In brief, the framework hypothesises that there could be a two-way relationship between FDI and the economic growth of the host country and EOR is a necessary condition for this relationship. Since FDI and economic growth are closely associated with knowledge and technologies, human capital in the host country, *inter alia*, certainly matters. In the next sections, we investigate the impacts of human capital on economic growth and how it could influence the impacts of FDI on economic growth.

1.2 - Human Capital and the Impacts of FDI on Economic Growth

1.2.1 - Human Capital and Economic Growth

1.2.1.1 – Theoretical arguments

The term "human capital" probably was first introduced by Schultz in his work in the early 1960s (Schultz, 1960, 1961). Generally speaking, human capital is the capability of labour to perform and/or learn to perform a job. It is argued that human capital is accumulated by schooling (Schultz, 1960; Nelson and Phelps, 1966), informal education, such as on-the-job training (Arrow, 1962 and Lucas, 1988), and research and development (Romer, 1986, 1990). Other forms of human capital accumulation like health and nutrition have also been addressed (for example Ranis et al., 2000).

A widely known hypothesis in the literature is that human capital is a driving force of the economic growth process. Human capital "… *predominantly account[s] for the productive superiority of the technically advanced countries*" (Schultz, 1961, p. 3) and investment in human capital is suggested as the path that developing countries should take to catch up with the more developed ones. The existing literature suggests several channels through which human capital influences economic growth, including: i) promoting productivity and technological progress; ii) changing the composition of

production and exports; iii) promoting income equality and iv) reducing population growth.

The most popular postulation is that human capital is a key factor to enhance productivity and promote technological progress. The models of schooling (Schultz, 1960), learning-by-doing (Arrow, 1962 and Lucas, 1988) and endogenous technical change (Romer, 1986, 1990) imply that a more educated workforce which achieve higher productivity because they are equipped with skills or capabilities to learn new techniques. Among different types of human capital accumulation, Ranis et al. (2000) suggest that primary and secondary education, health and nutrition raise the productivity of workers; secondary education, including vocational training, facilitates the acquisition of skills and managerial capacity; and tertiary education supports the development of basic science. Arrow (1962) also advances a hypothesis that technical change could be ascribed to experience, or learning by doing, as favourable responses (to problems) are selected over time.

Beside formal and informal education, research and development is also hypothesised to play an important role in promoting technological progress (Romer, 1986, 1990). Romer argues that knowledge must be accumulated so that innovation never reaches a bottleneck that would slow down the rate of economic growth. This model of endogenous technical change by Romer initiates the so-called new growth theory, in which technological progress plays a vital role in the growth process. Romer's model, however, deals mainly with countries that are world leaders in research and development. For developing countries, investment in human capital in order to have advanced innovations is not feasible. Technology diffusion from advanced countries has been assigned a central role in the process of the conomic growth of developing countries (Blomstrom et al. 1994). Investment in human capital, including research and development, to adopt and adapt technologies that have been invented

elsewhere seems to be a cheaper and more efficient alternative.

The literature has highlighted the dependence of the growth rates of developing countries on the extent of the adoption and implementation of new technologies that are already in use in leading countries (see for example Findlay, 1978, Blomstrom et al. 1994). It is argued that the adoption and implementation of advanced technologies requires the presence of a certain level of human capital in the host economy. In this context human capital development could be seen as a facilitating factor in the international transfer of technology from innovating countries, in most cases developed countries, to imitating ones, in most cases developing countries. Nelson and Phelps (1966) suggest that the stock of human capital of a developing country limits its absorptive capacity for advanced technology. More particularly, Easterlin (1981) blames inadequate formal schooling in developing countries for the limited spread of modern technology. Ranis et al. (2000) argue that the health and education of a population constitute an important ingredient in a system's capacity to borrow foreign technology effectively. Particularly they point out tertiary education as a supporting means for the appropriate selection of technology imports and the domestic adaptation and development of technologies.

Another way in which human capital influences economic growth is by changing the composition of production and exports. Lucas (1988) argues that production patterns are dictated by comparative advantages and each country produces goods for which its human capital endowment suits it. Countries accumulate skills by doing what they are already good at doing, intensifying whatever comparative advantages they begin with. Ranis et al. (2000) suggest that the education and skills of a developing country's labour force influence the nature of its factor endowment and consequently the composition of its trade. As production and exports of skill- and technology-intensive products could have more positive impacts on economic growth

than labour-intensive and natural-resource-based products[1], the above theoretical arguments imply that human capital development that shifts the production and exports of a country towards skill- and technology-intensive could promote higher economic growth. The dramatic success in manpower planning and promoting manufacturing exports of some East Asian developing countries provides an illustrate example for this hypothesis[2]. Ranis et al. (2000) also suggest a positive feedback from improved human capital to greater income equality and lower population growth, which is likely to influence economic growth positively.

The theoretical literature has emphasised the positive impacts of human capital on economic growth, especially through its positive impacts on productivity, technological progress and the composition of production and exports. Such impacts could even be intensified due to the externality effects of the improvement in human capital. The externality effect occurs when an individual's or a firm's human capital has effects not only on his/its own productivity but also on other individuals'/firms' productivity. Romer (1986) notes that a firm can learn how to build a new product or improve its production process by observing the activities of other firms. Consequently, human capital accumulation is not limited to its direct objective; rather it is a "*social activity*" (Lucas, 1988, p. 19). The externality effects make the social marginal productivity of human capital higher than its private marginal productivity (Arrow, 1962) and the accumulation of human capital has increasing returns (Lucas, 1988 and Romer, 1986, 1990). Lucas (1988) points out that human capital cannot serve as an engine of growth if there are diminishing returns to human capital accumulation.

1.2.1.2 – Empirical evidence

There are two main approaches to empirically assess the impacts of human

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[1] Skill- and technology-intensive products have higher income elasticity and value added than labour- and natural-resource-based products. The former is also less subject to fluctuations in commodity prices than the latter. Thus exports of skill-and technology-intensive products are deemed to have higher value and contribute more to economic growth.

capital on economic growth. One approach treats human capital accumulation as an input in the production function and thus proxies for human capital enter the growth equation as explanatory variables. The second approach, assuming that human capital influences economic growth via technological progress, estimates the impacts of human capital on productivity growth. There is a theoretical argument supporting this approach. Nelson and Phelp (1966) note that treating human capital simply as another factor in growth accounting may misspecify its role. Both methods use various indicators of human capital such as literacy, life expectancy, school enrolment and school attainment.

Findings of empirical studies on the impacts of human capital on economic growth are mixed. Benhabib and Spiegel (1994) for example find education enters insignificantly in explaining per capita income growth rates but has a positive relation with the growth rate of total factor productivity. Meanwhile Ranis et al. (2000) find that levels and changes in life expectancy and adult literacy as indicators of human development have significant and positive effects on economic growth. Several issues contribute to this ambiguity in empirical findings. Temple (1999) points to measurement errors in the education data and to the inclusion of a small number of countries where human capital accumulation has had little or no effect on growth in the sample. Wolff (2000) suggests five reasons for poor results for measures of formal education in accounting for productivity growth, including poor quality of the education data; lack of comparability in formal education measures across countries; specification errors; the ambiguous relationship between the education variable and growth; and the fact that only some forms of schooling and training are related to growth[3].

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[2] See Chapter IV for more details on the export composition of ASEAN countries.
[3] Wolff (2000) also provides a review of the empirical evidence on the effect of education on economic

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1.2.2 - Human Capital and the Impacts of FDI on Economic Growth

The framework of the two-way relationship between economic growth and FDI (Chapter IV) proposes that FDI could contribute to economic growth through three channels A1, A2 and A3 (see Section 1.1 and Graph IV.1). This section investigates the role of human capital in the process of FDI contributing to economic growth, i.e. flow of influence in Direction A, Graph IV.1. The accumulation of human capital is shown to enhance the impacts of FDI on economic growth in at least two ways: i) it improves the impacts of FDI on productivity and technology diffusion and ii) it improves the impacts of FDI on the pattern of production and exports.

As discussed previously, a key contribution of FDI to economic growth is by enhancing the productive capacity of host country (A3). The impacts of FDI on the country's productive capacity are twofold. First, as Blomstrom et al. (1994) argue, much of the international dissemination of technology is connected to FDI. Technology brought by FDI in the form of capital goods, advanced technologies and entrepreneurial skills allows the foreign sector to operate with higher productivity and at a higher technological level than the domestic sector. Second, technology and skills, brought about by FDI, could be diffused to the domestic sector to stimulate higher productivity and technological efficiency through spillover effects (see e.g. Findlay, 1978 and Blomstrom et al. 1994). Spillover effects occur when domestic firms observe and learn from their foreign counterparts. Spillover effects could also occur through linkages when domestic firms become suppliers or buyers of FDI firms.

Human capital can play a vital part in the impact of FDI on the productive capacity of the host country. *Firstly*, for FDI to transfer technologies to the host country (for its own use), the amount of human capital in the country must reach the level necessary to implement and operate such technologies. Local technicians and workers should be able to work with new technology or at least learn to work with it. In other

growth.

words, new technology can be implemented only when the labour force has built up the corresponding skills. The cost of foreign labour and/or training for local workers might discourage foreign firms from bringing in capital goods with modern technology. Consequently, inadequate human capital could limit the transfer of advanced technology and knowledge by FDI, and limit the contribution of FDI to economic growth. *Secondly*, human capital is essential for the domestic sector to improve its technological progress with spillover effects from FDI. Through linkages, domestic firms can improve their productivity and technological level when FDI firms help them to set up production facilities, provide technical assistance to raise the quality of products, assist in purchasing raw materials, and provide training and help in management[4]. Human capital is a key factor in this process of technology diffusion from FDI. Whether domestic firms could adopt and adapt new technology brought by FDI depends considerably on their stock of human capital. The decision of FDI firms to establish linkages with domestic firms also depends crucially on the technological capability of the latter, which in turn depends on its human capital. Domestic firms should be able to implement and operate at the technical level necessary for their products to meet the requirements of FDI firms. This in many cases not only requires the purchase of new machinery but also the appropriate cohort of technicians and skilled workers. Consequently, human capital is essential for domestic firms to improve productivity and technological progress through adopting and adapting technologies from FDI. A high level of human capital also helps domestic firms in searching for new and more efficient technology, and in competing in a competitive environment created by the presence of FDI.

Another major contribution of FDI to economic growth, especially export-oriented FDI, is by increasing exports. The types of export products that export-oriented FDI produces depend on the comparative advantages endowed in developing

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[4] See Blomstrom et al. (1994) for a review.

countries. The advantages that many developing countries have are natural resources and cheap labour costs. Consequently, exports by FDI firms are mostly comprised of natural-resource-based and labour-intensive products. These products are vulnerable to the volatility of demand and price in the world market and have low value added. Thus the contribution to economic growth from these exports might be limited and specialising in producing and exporting these products might not be a solution for sustainable growth[5]. Exports of manufacturing skill- and technology-intensive products could contribute more to growth because these products have higher added value and are less prone to price volatility than natural-base and unskilled-labour-intensive products. Therefore a higher level of human capital could increase the impact of FDI on exports in qualitative terms, i.e. by changing the pattern of exports by FDI firms. The success of some East Asian countries in promoting skill- and technology-intensive exports in the late 1980s and 1990s shows the importance of human capital accumulation, especially labour training and manpower planning (see Section 2 for more details). Several developing countries, such as Sri Lanka and Mauritius which have been specialised in labour-intensive manufacturing like garments and footwear, face shortages in skilled labour and find it difficult to move into value-added and technology-intensive production[6]. A high level of human capital stock could change the pattern of production and exports made possible by FDI towards technology- and skill-intensive and high value-added outputs, and thus increase the contribution of FDI to economic growth.

1.3 - Human Capital and FDI

1.3.1 - Human Capital Development Induces More FDI

It has been widely argued that the stock of human capital in a host country is a

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[5] See Prebisch (1962) and Moon (1998)
[6] Wignaraja (1998) and Lall and Wignaraja (1998)

determining factor of FDI[7]. Although low labour cost is recognised as one location advantage of developing countries, and some scholars would even argue that cheap labour force can offset big differences in productivity (for example Sharpton, 1975), human capital or labour quality has been emphasised as a positive determinant of FDI. Lall (1978) identifies a cheap but relatively skilled labour force as a factor that foreign investors look for in developing countries. More recently, Lucas (1990) conjectures that a lack of human capital, mainly in the sense of formal education and training, discourages foreign investment to developing countries while Lecraw (1991) argues that education and a disciplined workforce are positive determinants of foreign firms' decisions. Empirical studies find that the availability of semi-skilled and skilled-labour force at a reasonable cost is what foreign investors look for. Indicators of the human capital stock such as literacy rate and secondary school enrolment are found to be positively related to FDI (for example Schneider and Frey, 1985 and Urata and Kawai, 2000). The supply of a skilful workforce at comparatively low cost has contributed to the success of some developing countries in attracting FDI, such as Southeast Asian countries (Chia, 1999) and China (Dees, 1998). The lack of skilled labour force is reported as a deterrent of FDI to many other developing countries[8]. The literature tends to suggest that low wages combined with a skilled labour can give a developing country its comparative advantage.

1.3.2 - Human Capital Development Attracts Higher-Quality FDI

As discussed above, the accumulation of a human capital stock contributes to higher economic growth, enhances the contribution of FDI to growth and induces more FDI. An important channel through which human capital could enhance the contribution of FDI to growth is by changing the pattern of production and exports by FDI firms. That is, a country with a high stock of human capital is more able to host

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[7] For a review of theoretical arguments and empirical evidence, see Chapter II for details.
[8] Wignaraja (1998) for Sri Lanka; Lall and Wignajara (1998) for Mauritius; Urata and Kawai (2000) for

FDI that manufactures and exports skill- and technology-intensive products. It is very unlikely that a developing country with a shortage of skilled workers and technicians would be able to attract FDI for the production and export of value-added and technology-intensive goods. Developing countries that have abundant unskilled workforces like Indonesia, Sri Lanka and Mauritius have hosted FDI in unskilled-labour-intensive industries such as garments and textiles. Meanwhile countries with pools of skilled labour like Singapore, Malaysia and Mexico have hosted FDI in comparatively more technology-intensive industries such as electronics and electric goods. In the internationally-integrated production chain of multinational corporations, manufacturing of low value-added products that require cheap unskilled labour tends to be located in countries endowed with low human capital. Products that require technologically sophisticated machinery and a skilled labour force tend to be manufactured in countries having high stocks of human capital. It is thus essential for a country to accumulate its stock of human capital in order to move upward in the production chain. High levels of human capital stock could attract higher level, and more importantly, "higher-quality" FDI, the kind of FDI that could promote high and sustainable economic growth, e.g. FDI in value-added, skilled- and technological-intensive industries. The stock of human capital in a developing country therefore affects both the kind of FDI that it can attract and also the contribution of FDI to growth, because different kinds of FDI could have different growth consequences[9].

1.4 – The Trade Regime and Human Capital in the Two-way Relationship between Economic Growth and FDI

Our discussion so far has argued that human capital could be a positive factor in the two-way relationship between economic growth and FDI. This relationship is

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Japanese FDI in other developing countries, especially Asia.
[9] A study by Dutt (1997) puts forward this hypothesis. See also Section 1.2.2.

however dependent upon the trade regime[10]. More particularly, the implementation of EOR is a necessary condition for the two-way flow of influence between growth and FDI. This analysis goes further in examining two situations: i) when a country is endowed with a high stock of human capital but EOR is not implemented and ii) when a country adopts EOR but has a low stock of human capital.

In the first situation, when a country does not seek to promote exports, the type of FDI that a developing country could attract is mainly domestic-market-oriented FDI. Although it could receive some export-oriented FDI, foreign investors might not find exporting a prime target due to lack of incentives or the presence of trade barriers that limit importing capital goods and inputs for export production. In Direction A, although its contribution to economic growth through export is not large, FDI could boost domestic demand (A1). Nevertheless it could be expected that the major impact of FDI on economic growth is via technological progress due to the presence of the high stock of human capital (A3). With its accumulated human capital the country could adopt and adapt technologies transferred by FDI. The domestic sector could develop and benefit from spillover effects. The main problem in this situation is the small domestic market where the majority of the population has low incomes - a typical situation in a developing country. Even if the country has high growth rate, it might take time to make the market become sizeable due to its small initial level. This could limit the amount of domestic-market-oriented FDI that the country could attract. The small domestic market also constrains the impacts of FDI on domestic consumption and investment. More importantly it could limit the impacts of FDI on technological progress because the lack of economy of scale due to the small domestic market could discourage foreign investors to transfer advanced technology. Consequently, even when a country is endowed with a high level of human capital, its small domestic market and lack of export promotion limit the amount of FDI that the country could receive and

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[10] See details in Chapter IV.

hence the contribution of FDI to growth. In that case high economic growth might still attract FDI, although the amount of FDI might be either too small or its impacts on domestic demand and technological progress might be too small to make any considerable contribution to growth. The two-way relationship between economic growth and FDI, therefore, might not exist.

In the second situation, when EOR is implemented it seems to relax the constraint of the small domestic market with low income levels. A developing country could attract FDI that targets its cheap labour force and some other location advantages to produce for foreign markets. FDI could contribute to economic growth by increasing exports (A2 in Graph IV.1). FDI could also have some impacts on domestic demand (A1). FDI could bring in technology and improve the technological progress of the host country (A3) without being constrained by the problems of lack of economies of scale or low domestic demand. As discussed in Chapter IV, with the implementation of EOR, growth and FDI could be interdependent. Nevertheless, if the human capital stock is low, several problems appear to prevent this two-way relationship becoming sustainable. First of all, inadequate human capital, more specifically the lack of a skilled labour force, makes the country specialise in producing unskilled-labour-intensive products, which is not favourable for growth. Secondly, a low level of human capital also makes it difficult for the domestic sector to benefit from the technology effects of FDI and inhibits the development of the domestic sector. Thirdly, as the country becomes a labour-intensive export platform for FDI firms, low wages are a location advantage to attract FDI and thus the level of income is maintained at a low level, keeping domestic market small. Fourthly, the lack of a skilled labour force resulting from low human capital, is a negative factor for FDI because firms either have to pay high wages to attract skilled labour from other firms in the country or have to recruit foreign expatriates. If human capital development is not pursued, not only the

technology benefits from FDI and the effects of FDI on domestic investment but also the attractiveness of the country decreases. Economic growth might not be sustainable and the country starts facing difficulties in attracting more FDI when other developing countries with abundant unskilled labour also try to attract FDI.

In brief, although the two-way relationship between growth and FDI is conditional upon the choice of trade regime (more particularly, the implementation of EOR) human capital accumulation facilitates and enhances the sustainability of this relationship. When EOR is not implemented, even if the country has a high level of human capital, its small domestic market constrains the contribution of FDI to growth and the amount of FDI that it could attract. When EOR is implemented, the relationship could exist even if the level of human capital is low. Nevertheless, FDI's contribution to the country's growth could be decreasing and the country might find it difficult to attract more FDI. More importantly, the growth dynamic will be weak if the country relies too much on the world market for its unskilled-labour-intensive exports and if domestic demand remains low.

1.5 - Hypotheses and Testing

Based on the theoretical arguments discussed previously, this section tests the hypothesis that the accumulation of human capital could be a positive factor in the two-way relationship between economic growth and FDI. This hypothesis is tested with the sample of four ASEAN countries - Indonesia, Malaysia, Singapore and Thailand - during 1975-1995. This is because the findings of chapter IV show that the two-way relationship between economic growth and FDI existed in these countries during the period. If the sample was extended to include some countries where the two-way relationship between growth and FDI does not exist the impacts of human capital might be miscalculated. The ASEAN countries are high-growth economies and large FDI recipients. The ASEAN governments, particularly Singapore and Malaysia, have also

invested in human capital to promote FDI-led and export-led economic growth. Testing the hypothesis about human capital with the sample of these countries therefore could bring very interesting results. Section 2 discusses education and manpower policies in the ASEAN countries in the last few decades.

2 - Human Capital Development in the ASEAN Countries

This section reviews an important element of human capital development in the ASEAN countries, i.e. education and skill development. In these countries the system of education and skill development has changed dramatically during the past few decades. The growth and transformation of education and skill development has been designed with the objective of achieving high economic growth. A publication by the World Bank in 1993 argues that these countries (and some other Asian tigers) have created a new model, a key component of which is forging newer and closer links between education, skill development and economic growth (World Bank, 1993). Table V.1 presents several key indicators of human capital development in the ASEAN countries.

Table V.1 - Indicators of Human Capital Development in the ASEAN Countries (1960-1998)

	Population with no schooling[a](%)		Manufacturing Value Added per worker[b]		Edu. Spending per head[c]		Edu. Spending as % of GDP (%)	
	1960	1995	1975	1997	1975	1997	1975	1997
Indonesia	75.5	44.3	2,845.67	4,291.64	4.82	12.53	2.07	0.62
Malaysia	58.5	16.7	8,496.67	11,848.7	108.22	175.95	4.96	3.95
Singapore	60.7	14.3	14,434.61	44,236.4	199.80	808.05	2.52	2.36
Thailand	48.1	19.6	4,763.15	9,021.29	29.29	120.41[*]	2.56	3.23

[a] : % of population aged 25 and over. Extracted from Barro-Lee Data Set for 138 Countries from the NBER website: http://www.cid.harvard.edu/ciddata/ciddata.html

[b] and [c] : at constant 1990 US$. Author's calculation with data from World Bank (2000) and ADB (various issues). For details on how the indicator was calculated see APPENDIX IV.2.

[*] : Data at 1996

The ASEAN governments have pursued very different policies towards

education and skill development. In general, the ASEAN countries have invested heavily in education, concentrating on primary and secondary schooling. The role of education and skill development is emphasised mainly in facilitating the transfer of technology, not in achieving technological leadership. Thus the objectives of manpower planning are to improve general education, vocational training and skills. Nevertheless the ASEAN countries have very different levels of human capital stocks, which have also been accumulated at very different rates.

Table V.1 shows that in 1960, more than three fourths of the Indonesian population aged 25 and over had no schooling. Around 60% of the Malaysian and Singaporean population had no schooling. Thailand had the lowest ratio of no schooling at 48%. By 1995, Singapore was successful in reducing the ratio to only 14%. Meanwhile the ratio in Indonesia was also reduced, though not as much as in Singapore. In 1995, more than 40% of the population of Indonesia still had no schooling. The ratios in Malaysia and Thailand were below 20%.

If manufacturing value-added per worker is taken as an indicator of labour productivity[11], the picture is also very different for each country. Table V.1 and Chart V.1 show the trend in value added per worker in the manufacturing sector in the ASEAN countries. Between 1975 and 1997, an Indonesian worker managed to increase his annual manufacturing added value from US$ 2,845.67 to US$ 4,291.64. A Malaysian worker produced US$ 8,496.67 in added value in 1975 and US$ 11,848.68 in 1997. A Thai worker doubled his productivity to US$ 9,021.29 in 1997. A Singaporean worker could be considered as the most productive in the region. In 1997, a Singaporean worker produced US$ 44,236.49 in added value, which is more than 300% of his productivity in 1975.

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[11] This follows an empirical work of Balasubramanyam et al. (1999).

Chart V.1 – Manufacturing Value Added per Worker in the ASEAN Countries (1975-1997)
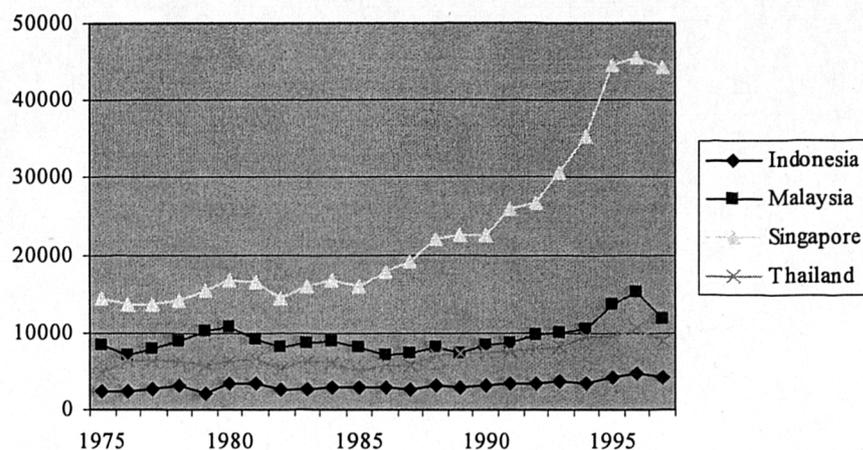
In terms of investment in human capital per capita, Singapore is the country that had the highest level of investment in education. In 1997, spending on education per head in Singapore was more than US$ 800, compared with US$ 175 in Malaysia, US$ 120 in Thailand and only US$ 12 in Indonesia. Total education spending as a ratio of GDP had decreased in all countries since 1975. The ratio was nearly 4% in Malaysia, 3.2% in Thailand, 2.3% in Singapore and only 0.6% in Indonesia. Indonesia is therefore the country that spent the least on education either as a share of GDP or in absolute terms. All four ASEAN countries have emphasised education at primary, secondary and tertiary levels. Nevertheless only Singapore and Malaysia, and to some extent Thailand, focus on vocational education and skill development.

To provide a comparison of human capital in the ASEAN countries and the rest of the world, table V.2 shows the number of years of schooling attained by the population in the ASEAN countries and the averages of some groups of countries in the World. In 1960 the number of years of schooling attained by the population of the ASEAN countries was similar to that of other Asian and Latin American countries, and well below that of developed countries. In 1995, the number of years of schooling in Indonesia, despite increasing from around 1 year in 1960 to 4 years, was equal to that of the Middle East and Africa, which is the lowest among the groups of countries

considered in Table V.2. Thailand performed slightly better than other fellow Asian countries. The numbers of years of schooling in Malaysia and Singapore are higher than that of other groups of developing countries and close to that of developed countries.

TableV.2 – Average Years of Schooling in the ASEAN and other countries (1960-1995)

(number of years)

	1960	1985	1995
Indonesia	1.11	3.65	4.03
Malaysia	2.34	4.88	7.65
Singapore	3.14	4.50	7.82
Thailand	3.45	4.78	5.73
East Asia and the Pacific	2.34	5.49	5.25
South Asia	1.21	2.26	4.77
Middle East and Africa	1.59	3.29	3.90
Latin America and the Caribbean	3.16	4.77	5.63
Developed Countries	6.36	8.09	8.99

Source: Calculated from Average Years of Schooling Attained by the Population Aged 25 and over from Barro-Lee Data Set for 138 Countries, the NBER website www.nber.org

The system of education and skill development and government policies of each country will now be discussed in detail.

Indonesia

Primary and secondary schooling has been emphasised in Indonesia since 1960. In 1960, only 22.6% of the total population aged 25 and above attained primary education[12], 1.9% had secondary and 0.1% had higher-secondary education. In the early 1970s when the oil boom led to a great expansion in government revenues, the government increased the allocation of resources to the educational sector. From the early 1970s to the latter part of the 1980s enrolments at both the primary and secondary levels increased rapidly (Booth, 1999). In 1975, the percentage of the population with primary, secondary and higher-secondary schooling increased substantially to 40.9%,

5.5% and 0.9%, respectively (Table V.3). In 1990, the ratios were 54.4%, 11.8% and 1.8%, respectively.

Table V.3 – Percentage of Population (aged 25 and over) with Primary, Secondary and Higher-Secondary School Attainment in Indonesia (1960-1990)

(in percentage)

	Primary	Secondary	Higher-Secondary
1960	22.6	1.9	0.1
1965	24.7	2.1	0.4
1970	39.1	5.1	0.5
1975	40.9	5.5	0.9
1980	48.4	9.6	0.8
1985	56.1	10.3	0.6
1990	54.4	11.8	1.8

Source: from Barro-Lee Data Set for 138 Countries, the NBER website www.nber.org

Despite improvements in education in primary and secondary education, the government seems to pay little attention to vocational and technical training, especially in the key industries for economic development. The attainment of secondary and higher-secondary schooling, which are important in promoting higher productivity and economic growth, is still limited, especially when compared with other ASEAN countries. In the early 1990s, Indonesia faced serious shortages in skilled labour (Booth, 1999). It seems that the Indonesian government did not make any effort during the 1990s despite this problem and the rise of other low-labour-cost competitors such as China and Vietnam.

Malaysia

The ratios of population with primary, secondary and higher-secondary education attainment in Malaysia in 1960 were 32.7%, 7.2% and 1.5%, respectively. These are higher than those of Indonesia in the same year. Unlike the Indonesian government, the Malaysian government has placed more emphasis on secondary and higher-secondary education ever since. In 1990, Malaysia had 27.1% of the population

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[12] In this section the population is referred to as the population aged 25 and above

with secondary schooling and 2.8% with higher-secondary schooling (Table V.4). Government expenditure on education was consistently higher than many other Asian countries, especially in expanding secondary and higher-secondary education.

Table V.4 – Percentage of Population (aged 25 and over) with Primary, Secondary and Higher-Secondary School Attainment in Malaysia (1960-1990)

(in percentage)

	Primary	Secondary	Higher-Secondary
1960	32.7	7.2	1.5
1965	38.6	7.8	1.4
1970	42.7	9.4	1.5
1975	48	12.6	1.6
1980	44.4	19.9	1.4
1985	44.8	23.3	2
1990	44.5	27.1	2.8

Source: from Barro-Lee Data Set for 138 Countries, the NBER website www.nber.org

Beside secondary and higher-secondary education, the government has also launched extensive programmes in vocational training and skill development with the clear objective of improving the country's human capital. The Malaysian government at federal and state levels has offered tax incentives for firms with technical in-house training programmes. Local agencies and foreign firms have participated in government collective programs to provide highly skilled labour, and to upgrade and update the skills and technical knowledge of workers and technicians. Various government organisations have been involved in this process such as the Ministry of Human Resources and the National Vocational Training Council. At the national level, the Human Resource Development Fund (HRDF) was launched in 1993 with a grant by the Government to encourage direct private sector participation in skills development programmes by providing firms with funds to defray or subsidise costs incurred in training their Malaysian employees. The National Vocational Training Council established under the Ministry of Human Resources coordinates the planning and development of a comprehensive system of vocational and industrial training activities

and programmes of all public sector training agencies as well as private training institutions. It also evaluates the demand for existing and future skills and identifies future vocational and industrial training needs as well as developing the National Occupational Skill Standards (NOSS) on a continuous basis. By 2002, there were more than 450 NOSS covering basic, intermediate and advanced training levels.

There has been an increase in the number of vocational and technical schools, polytechnics and industrial training institutions. Most of the training institutions are run by government agencies, although a number of private institutions supplement the government's efforts to produce the skilled workers needed by industry. The Ministry of Human Resources currently runs 14 industrial training institutes, offering industrial skills training programmes at basic, intermediate and advanced levels for pre-employment or job entry level. These institutions also conduct training programmes for skill upgrading and instructor training. The Ministry is also responsible for the running of other institutions, including the Centre for Instructors and Advanced Skill Training, the Japan-Malaysia Technical Institute and four Advanced Technology Centres[13].

There are also efforts at the regional level. A well-known example is the cooperation between the Penang State government and foreign firms to establish the Penang Skills Development Centre. This centre was established in 1989 by the Penang Development Corporation, a government-backed agency set up to promote the region's development, with major contributions from seven foreign subsidiaries in the region, including Hewlett Packard, Intel Malaysia, Siemens Litronix Malaysia and Robert Bosch Malaysia; and invloving several local education institutions. The objective of this centre is to define workforce needs, and provide necessary training and educational resources in Penang. Another joint venture between the Penang Development Corporation and IJM Corporation Bhd was inaugurated in 1992, offering educational programmes in technical disciplines with the goal of providing highly skilled

technicians and engineers[14].

Singapore

In 1960, 20.6% of the Singaporean population had primary education attainment, 25% had secondary education while none had higher-secondary education. Singapore in 1960 had the highest ratio of the population with secondary schooling, in comparison with other ASEAN countries in the same year. By 1990, Singapore had 31.3% of the population with secondary schooling, highest among the ASEAN countries. 4.7% of the population had higher-secondary education (Table V.5).

Table V.5 – Percentage of Population (aged 25 and over) with Primary, Secondary and Higher-Secondary School Attainment in Singapore (1960-1990)

(in percentage)

	Primary	Secondary	Higher-Secondary
1960	20.6	25	0
1965	26.3	21.8	0.5
1970	29.6	20.9	2
1975	32.4	23.9	3
1980	38.3	14.6	3.4
1985	39.9	20.1	4.3
1990	34.6	31.3	4.7

Source: from Barro-Lee Data Set for 138 Countries, the NBER website www.nber.org

Among the ASEAN countries, Singapore is also the country that has spent the most on education (table V.1). The Singaporean government has explicitly stressed the importance of human resource development and the pursuit of excellence in education in its development strategy. Manpower planning has been carefully designed and generously funded. Educational opportunities have certainly expanded in Singapore since the mid-1980s, especially at the upper secondary, vocational and tertiary levels. In the early phase of Singapore's economic development, much of the industrial development was labour-intensive and demanded relatively unskilled workers. As the

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[13] Website of the Malaysian Industrial Development Authority (MIDA): www.mida.gov.my
[14] Palacios (1995)

government recognised that this type of economic growth is not sustainable, investment in human resources has been addressed as crucial for future development.

In Singapore, higher education and work-based skills development has been emphasised to conform with the strategy of moving to an innovation-driven economy from a factor and investment-driven economy. Government agencies such as the Ministry of Manpower, the Productivity and Standards Board and the Skill Development Fund have been in charge of developing the workforce. To develop a skilled workforce, Singapore provides incentives for workers to acquire more training and knowledge by strongly recommending companies to increase wages and to consider this as a means of driving up workforce skill levels. This and the limits of human resources in Singapore can in part explain the increase in Singaporean wages. However Singapore has managed to provide a labour force with a high skill level that can compensate for high wages by creating both demand and supply for skilled labour. On the demand side, the government increases employers' demand for training and for a highly skilled labour force. On the supply side, the government increases the worker productivity with different training programmes. The State-level interventions include taxing firms that employ unskilled workers, at the same time paying up to 80% of the cost of employer-based training. Training strategies are developed in close liaison with domestic and international market requirements through an extensive network of 16 industry-training centres in which MNCs share space and expertise with local firms[15].

Thailand

During 1960-1990, Thailand focused on primary education. Among the ASEAN countries, Thailand has the highest ratio of the population with primary schooling attainment. In 1960, 46.4% of total population had primary schooling; in 1990 it was 65.3%. This could be attributed to a government policy that emphasised universal

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[15] Website of the Ministry of Manpower, www.mom.gov.sg and Website of Ministry of Trade and Industry, www.mti.gov.sg

primary education from the First to the Sixth National Economic and Social Development Plans (1961-1991). Higher-secondary education in Thailand also played a part. In 1990, 8% of the Thai population had higher-secondary schooling, higher than other ASEAN countries (Table V.6).

Table V.6 – Percentage of Population (aged 25 and over) with Primary, Secondary and Higher-Secondary School Attainment in Thailand (1960-1990)

(in percentage)

	Primary	Secondary	Higher-Secondary
1960	46.4	4.9	0.6
1965	49.9	4.7	0.9
1970	60.4	4.4	1.1
1975	64.2	4.6	1.5
1980	69.7	6.8	2.9
1985	67.5	6.1	5
1990	65.3	4.7	8

Source: from Barro-Lee Data Set for 138 Countries, the NBER website www.nber.org

Secondary education, however, remained almost unchanged during the period. By 1990 only 4.7% of total population attained secondary schooling, which is well below the ratios of 31.3% and 27.1% in Singapore and Malaysia, even lower than the ratio of 11.8% in Indonesia (see tables V.3, V.4 and V.5). By the early 1990 the Thai government recognised the low level of educational attainment of its labour force as well as the lack of opportunity to undertake higher education among its citizens. The Eighth National Economic and Social Development Plan admitted that three quarters of the labour force are unskilled workers, having received an average of only 5.1 years of education and that this situation is a limitation in improving the productivity of the labour force and in raising the quality of products so as to compete in the world market. Since the start of the Eighth Plan in the early 1990s, the Thai government has been committed to utilise human development as the core of national development by means of expanding compulsory education in accordance with the Eighth National Economic and Social Development Plan. Expenditure has increased for teaching, training and

upgrading of school facilities. Increased education in the labour force and skill development to meet changes occurring in production in the agriculture, industrial and service sectors have been emphasised. The government also encourages co-operation between the public and private sectors and private participation in education and skill development[16].

The government also set up the Department of Skills Development, a government unit under the Ministry of Labour and Social Welfare, to fulfil its vision of skill development in the next decade. The department is responsible for national manpower planning, providing training to increase the potential of the labour force in accordance with the industrial restructuring plan. This department has supported the private sector in establishing Skill Standard Testing Centres and a skill development monitoring and evaluation system[17].

3 – Methodology

3.1 - Model Specification and Econometric Technique

This empirical work is based on the framework of the two-way relationship between economic growth and FDI outlined in Chapter IV. The framework includes two equations, the growth equation (1) and the FDI equation (2). The expected sign of each variable is shown in brackets under each variable. The main objective of this empirical work is to test the hypothesis that human capital accumulation plays a positive role in the two-way relationship between economic growth and FDI. To do so, variables of human capital are included in both equations and the empirical work is to test the hypotheses that coefficients of these variables are positive and significantly different from zero. Section 3.2 will discuss the choice of a proxy for human capita.

[16] Website of Ministry of Education: www.moe.go.th
[17] Website of the Department of Skill Development: www.dsd.go.th

$$\Delta\ln(GDPPC) = f(\Delta(FDIStock), \ln(Invest/GDP), \Delta\ln(ConsPC), \ln(Open), Hcapital) \qquad (1)$$
$$\qquad\qquad (+) \qquad\qquad (+) \qquad\qquad (+) \qquad (+) \qquad (+)$$

$$\Delta\ln(FDIStock) = f(\Delta\ln(GDPPC), \ln(GDPPC_{-1}), \ln(FDIStock_{-1}), \ln(Open), Hcapital) \qquad (2)$$
$$\qquad\qquad (+) \qquad\qquad (+) \qquad\qquad (-) \qquad\qquad (+) \qquad (+)$$

where: $\Delta\ln(GDPPC)$ = growth rate of real GDP per capita.

$\Delta\ln(FDIStock)$ = growth rate of real FDI stock.

$\ln(Invest/GDP)$ = log of gross domestic investment as a share of GDP.

$\Delta\ln(ConsPC)$ = growth rate of real consumption per capita.

$\ln(Open)$ = log of the sum of exports and imports as a share of GDP.

$\ln(GDPPC_{-1})$ = log of real GDP per capita in the previous period.

$\ln(FDIStock_{-1})$ = log of real FDI in the previous period.

Hcapital is a proxy for human capital.

More details about the model specifications, variables and data sources can be found in Chapter IV and Appendix IV.2. The openness variable is included in the model because the empirical findings of chapter IV suggest that the significance of the two-way relationship between economic growth and FDI is conditional upon the inclusion of an EOR variable, which is the degree of openness of the country.

Equations (1) and (2) are estimated with the simultaneous-equation regression for panel data. This study applies the Two-Stage-Least-Square (2SLS) estimation with all pre-determined variables of the system as instruments. The Least Square Dummy Variable technique is used to deal with the panel dimension of the data. Section 3 of Chapter IV provides details about the econometric technique.

3.2 - Proxies for Human Capital

In order to test for the hypothesis that human capital could be a positive factor in the two-way relationship between growth and FDI, this study uses three different indicators of human capital. A suitable proxy for human capital is still controversial in the literature. Due to the problems of data quality and availability in developing countries, popular proxies for human capital in the literature are education proxies such as school enrolment rates and the number of years of schooling, and health proxies such

as life expectancy. Estimating the impacts of human capital using these proxies has limitations[18]. This study attempts to contribute to the literature by testing three different proxies, one is an index calculated by other scholars and two are carefully constructed by the author. These proxies are expected to perform better in our estimation.

The first indicator is the index of human capital constructed by Bosworth and Collins (1996). This index is an indicator of labour quality, built on the educational attainment data from Barro and Lee (1993) and weighted by returns to schooling, i.e. earnings of different educational groups. This study uses the index rather than other more-familiar proxies for human capital such as secondary school enrolment or years of schooling because the index considers education and earnings of different educational groups[19]. Education variables, like enrolment and years of schooling, present only the education component of the stock of human capital in a country. They are not good indicators for skills accumulated in the labour force. As skilled- and semi-skilled workers tend to receive higher wages than unskilled workers, earnings of different educational groups reflect the rewards from education/skills accumulation and, to some extent, the willingness of the society to attain education/skills[20]. It therefore considers how the country makes use of the education attainment that its labour force has accumulated, and whether educated and skilled workers have the employment opportunities and are paid at their skill levels. Thus by giving more weight to workers with skills, the index is a better proxy for human capital accumulated in the country. In explaining the determinants of FDI, the index is also a better proxy than a mere education variable because it reflects labour quality adjusted by labour cost in the country, both of which are of concern to foreign investors[21]. To estimate the impacts of

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[18] Bosworth and Collins (1996), Wolff (2000)

[19] Bosworth and Collins (1996) argue that the enrolment rate and the years of schooling are poor indexes of labour quality because the former only works in the steady state and the latter assigns workers with zero education a weight of zero.

[20] Higher salaries paid to workers with education and skills encourage individuals and households to accumulate education and skills.

[21] Some studies such as Culem (1988), Lecraw (1991), Chen C. L. (1997a) and Billington (1999) have

human capital on the two-way relationship between economic growth and FDI this study uses the annual growth in the index values - Δln(HCapital). The level of index values is not used because value 1 is assigned to all countries in year 1960.

The second proxy used in this study for human capital is real public spending[22] on education per capita. This indicator is not used widely either in the growth or in the FDI determinant empirics, probably due to lack of data. In this study we construct this indicator from data on public spending on education as a share of GDP, real GDP and total population. The inclusion of this proxy is based on the postulation that spending on education contributes to the accumulation of the human capital stock[23]. Although higher spending does not always bring higher quality of education or more educational opportunities, public education spending could reflect the government's effort in human capital development. In our sample countries, large differences in education spending across countries seem to be associated with differences in education attainment. For example, Indonesia is the country with the lowest number of years of schooling (Table V.2); it spent US$6.3 per head in 1970 and only US$5.5 in 1995 on education (all in 1990 prices). Meanwhile Singapore, a country with a pool of high skilled labour, technological-intensive activities and the highest number of years of schooling, increased its education spending per head by more than five-fold from nearly US$100 to US$568 in the same period. This study estimates the impact of the growth rate of real public spending on education - Δln(EduSpend) – and the level of real public education spending - ln(EduSpend) - on the relationship between economic growth and FDI.

The third proxy that this study uses for human capital is real manufacturing

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advocated wages adjusted for labour quality as a FDI determinant rather than the wage or the education variable. For more details see Chapter II.

[22] This is public spending on public education plus subsidies to private education at the primary, secondary and tertiary levels.

[23] Of course there have been exceptional cases where massive spending on education is inefficient such as in the African countries in the 1960s and 1970s (see Todaro, 1992).

value added (MVA). The growth rate of real MVA - Δln(MVA) - and the level of real manufacturing value added per worker - ln(MVAPW) - are used as indicators for indigenous technological capability. MVAPW is real MVA at constant 1990 US$ prices divided by the number of workers in manufacturing. Using MVA as an indicator of human capital is another experiment of this study. Our assumption here is that the growth and level of MVA could represent the technological capability of the labour force of the country. Although one can argue that high MVA can be the result of the presence of capital-intensive equipment, the notion that certain skills are required to operate such equipment supports our assumption. MVA could also be regarded as a proxy for the structure of manufacturing. High-value added industries that require skilled labour contribute more to total MVA than low-value-added and unskilled-labour-intensive industries. MVA therefore not only represents the human capital stock in terms of the technological capability of the labour force but also captures the impact of human capital on the composition of production. It would be ideal to estimate the impacts of MVA by foreign firms and by domestic firms separately in order to estimate the contribution of FDI to the technological capability and manufacturing structure of host countries. This study, unfortunately, cannot perform this estimation due to the lack of data[24].

3.3 – Data Description

Details of data sources and compilations can be found in Appendix IV.2. Table V.7 presents statistical features of the data.

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[24] Only data on MVA in foreign and domestic sectors are available since the early 1990s for Singapore and Malaysia from the National Manufacturing Census.

TableV.7 - Statistical Description of Data

Series	No. of Obs.	Mean	Std Dev	Minimum	Maximum
$\Delta\ln(FDIStock)$	80	0.129	0.062	0.029	0.279
$\Delta\ln(GDPPC)$	80	0.051	0.026	-0.038	0.108
$\ln(Invest/GDP)$	84	3.464	0.205	3.143	3.881
$\Delta\ln(ConsPC)$	80	0.034	0.078	-0.195	0.157
$\ln(Open)$	84	4.658	0.820	3.707	6.085
$\ln(Export/GDP)$	84	3.970	0.823	2.910	5.372
$\Delta\ln(Labour)$	80	0.029	0.011	0.012	0.051
$\ln(GDPPC_{-1})$	84	6.713	1.264	5.819	7.607
$\ln(FDIStock_{-1})$	84	8.428	1.852	7.058	9.738
$\ln(Export_{-1})$	84	10.379	0.620	8.757	10.817
$\ln(OECD_{-1})$	84	16.275	0.451	15.956	16.594
$\Delta\ln(HCapital)$	84	0.397	0.181	-0.364	0.526
$\Delta\ln(EduSpend)$	84	3.193	11.231	-54.870	15.994
$\ln(EduSpend_{-1})$	84	3.326	1.225	1.417	4.192
$\Delta\ln(MVA)$	84	11.76	0.789	-7.281	24.118
$\ln(MVAPW_{-1})$	80	8.481	0.937	7.628	9.144

4 – Empirical Evidence

This section reports empirical results for the hypotheses about the role of human capital in the relationship between economic growth and FDI in the ASEAN countries during 1975-1995. The test is based on the model specification in section 3, which is comprised of two equations, the growth equation and the FDI equation. Tables V.8 and V.9 report the simultaneous-equation estimation for fixed-effects panel data for the growth equation and the FDI equation, respectively. There are seven specifications, designed to test the impacts of different indicators of human capital. In each table, the first part reports the coefficients and t-statistics of the explanatory variables, the second part reports those of the dummy variables. The last part shows results of diagnostic tests. Correlation matrixes of variables in the regressions are reported in Appendix V.3.

Overall, empirical results do not reject the hypothesis that human capital is a

positive factor in the two-way relationship between growth and FDI in the ASEAN countries during 1975-1995. Various proxies representing human capital in most cases have significant and positive coefficients in both the growth and the FDI equations. Most other variables have significant coefficients with the expected sign. In table V.8, the coefficients of real FDI stock growth are positive and significant. The growth rate of consumption and the degree of openness have significantly positive impacts on growth. In table V.9, the growth of real GDP per capita is also significantly and positively related to growth of the real FDI stock. Size of the domestic market, proxied by the level of GDP per capita, and the degree of openness are positive determinants of the growth of FDI while the existing stock of FDI is a negative determinant.

The empirical results suggest that the trade regime and human capital play different roles in the relationship between growth and FDI in the ASEAN countries during 1975-1995. Empirical findings from Chapter IV suggest that an Export-Oriented Regime (EOR) is a necessary condition for the existence of the two-way relationship between growth and FDI. When a variable representing EOR is excluded from the regression, the two-way relationship between growth and FDI becomes insignificant. When the sample is divided into two sub-periods, 1975-1985 and 1986-1995, the estimation results show that growth and FDI were interdependent only during 1986-1995, the period when EOR was launched in the ASEAN countries. During 1975-1985, when EOR was not actively promoted in these countries, the relationship between growth and FDI was not significant.

The role of human capital is different from that of the trade regime. Results from the empirical work of Chapter IV and this chapter suggest that, whether or not human capital is controlled for, there still exists a two-way relationship between economic growth and FDI in the ASEAN countries between 1975 and 1995. The existence of this two-way relationship between growth and FDI in the ASEAN

countries during 1975-1995 depends only on the implementation of EOR, not on human capital. Section 4.1 discusses findings about the role of human capital in Direction A of the relationship, i.e. from FDI to economic growth. Section 4.2 reports results on the role of human capital in Direction B, from growth to FDI.

4.1 - Human Capital and the Impacts of FDI on Economic Growth

Table V.8 reports results of the growth equation estimation. The impact of human capital is tested with three alternative indicators: the growth rate of the human capital index $\Delta\ln(HCapital)$, the growth rate of real public spending on education $\Delta\ln(EduSpend)$ and the growth rate of manufacturing value added $\Delta\ln(MVA)$. Coefficients of the human capital index fail to be significant and even have negative signs (Specifications 1 and 2). When the estimation is repeated with other more-common education variables such as secondary school enrolment and years of schooling attainment, these variables also fail to show any significant effect. Following Borensztein et al. (1998), several interactions between FDI and education variables are introduced to account for the impact of human capital on the contribution of FDI to growth[25]. The coefficients of these interactions are also insignificant. These results are consistent with results from various empirical studies, which have reported insignificant impacts of human capital in the growth equation in general and in the growth equation where FDI is an explanatory variable[26].

While the index of human capital shows no significant impact in the growth equation, real public spending on education has statistically significant and positive coefficients (Specification 3, 4 and 5). Since public spending on education is used as an indicator of the accumulation of human capital, and it is observed that the ASEAN governments have invested heavily in education and manpower planning to promote

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[25] The interactions tested are interactions between FDI stock and the growth rate of the human capital index, secondary enrolment rates, and years of schooling attainment.
[26] See e.g. Benhabib and Spiegel (1994), Temple (1999), Borensztein et al. (1998), Campos and Kinoshita (2002)

FDI-led and export-led growth, this finding is consistent with the hypothesis that human capital is a positive factor in the relationship between growth and FDI in the ASEAN countries. Although education spending has not been used widely in the empirical literature as an indicator of human capital, probably because of the suspicion about the degree of efficiency of education spending in developing countries and the lack of cross-country data, this variable performs well in our study. This, to some extent, is because the ASEAN countries provide a demonstrable example of government commitment in human capital development, especially through improving and creating opportunities for education and skill development, with the objective of achieving higher economic growth and attracting more FDI[27].

The third variable for human capital is the growth rate of manufacturing value added (MVA). This variable is used as a proxy for the productivity, or skill, of the labour force. Although capital-intensive equipment could be the reason behind the high growth of MVA, this proxy could represent the capability of the labour force to perform the job. This variable has highly significant and positive coefficients (Specifications 6 and 7). The inclusion of this variable also improves the goodness of fit - R_2 - of the regression considerably (from around 0.47 to 0.68). When this variable is included in the regression, the impact of the FDI variable is still significant and positive, although its coefficient and t-statistics have lower values than when MVA is not controlled for. Given the dominant role of FDI in the manufacturing sector in the ASEAN countries, especially in promoting manufacturing exports, and the role of manufacturing exports in total exports and the process of economic growth[28] this result shows that the manufacturing value added variable captures some impacts of FDI on economic growth. It supports the hypothesis that human capital, represented by the growth rates of value added in the manufacturing sector, exerts a positive impact on the

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[27] See Section 2 this chapter and Section 2, Chapter IV.

contribution of FDI to economic growth by enhancing FDI's technological effects and facilitating FDI's shift toward higher value-added and technology-intensive production and exports.

Overall, the empirical findings of this chapter confirm the postulation that human capital is a positive factor facilitating the contribution of FDI to economic growth. Results of this chapter and Chapter IV suggest that the presence of a considerable stock of human capital as compared with other developing countries[29] was not sufficient to explain the existence of the two-way relationship between growth and FDI in the ASEAN countries. The existence of this two-way relationship between growth and FDI in the ASEAN countries during 1975-1995 depends on the implementation of EOR, which was promoted actively from the mid 1980s. This result does not imply that human capital is unimportant in promoting economic growth and FDI in the ASEAN countries. It might be that the ASEAN countries had accumulated an adequate stock of human capital, especially in terms of education and skills development, which facilitated the EOR and FDI to promote export-led and FDI-led growth from the mid 1980s. It might also be that the implementation of EOR in the ASEAN countries enabled human capital to play a positive role in the relationship between FDI and economic growth. Miller and Upadhyay (2000) for example suggest that human capital interacts with openness to achieve a positive effect on total factor productivity. From a panel data estimation of 83 countries (developed and developing countries) during 1960-1989, they find that the effect of the stock of human capital on total factor productivity becomes conditional on the level of openness. For low levels of openness, the coefficient of the stock of human capital is negative. For high levels of openness, this effect of human capital on total factor productivity reverses and becomes positive.

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[28] For more details see Section 2, Chapter IV and Appendix V.4
[29] See Section 2

Table V.8 - Economic Growth, FDI and Human Capital: GROWTH EQUATION

Dependent Variable: Growth Rate of Real GDP Per Capita

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ln(Invest/GDP)	0.024	0.026	0.027	0.028	0.027	0.024	0.023
	(1.06)	(1.13)	(1.24)	(1.30)	(1.25)	(1.34)	(1.19)
Δln(FDI*Stock*)	0.141	0.168	0.141	0.150	0.143	0.100	0.107
	(1.69)*	(2.08)**	(1.96)*	(2.21)**	(1.98)*	(1.72)*	(1.77)*
Δln(ConsPC)	0.140	0.132	0.126	0.124	0.125	0.114	0.112
	(3.78)***	(3.60)***	(3.75)***	(3.73)***	(3.74)***	(4.23)***	(4.32)***
ln(Open)	0.037	0.036	0.036	0.036	0.036	-0.005	-0.004
	(1.86)*	(1.83)*	(1.98)*	(2.01)**	(1.98)*	(0.36)	(0.31)
Δln(HCapital)	-0.040	-0.232					
	(0.03)	(0.20)					
Δln(EduSpend)			0.034	0.034	0.034		
			(1.69)*	(1.67)*	(1.68)*		
Δln(MVA)						0.002	0.002
						(5.21)***	(5.30)***
DUM-INDO	-0.062	-0.063	-0.061	-0.062	-0.062	-0.018	-0.017
	(1.91)*	(1.93)*	(1.94)*	(1.96)*	(1.94)*	(0.66)	(0.60)
DUM-MALAY	-0.029	-0.030	-0.027	-0.028	-0.028	-0.014	-0.014
	(1.62)	(1.67)*	(1.58)	(1.61)	(1.58)	(0.94)	(0.87)
DUM-THAI	-0.067	-0.068	-0.064	-0.065	-0.064	-0.005	-0.004
	(2.15)**	(2.16)**	(2.10)**	(2.13)**	(2.11)**	(0.20)	(0.15)
R^2	0.457	0.446	0.478	0.475	0.477	0.686	0.684
t-value(Hausman)[a]	2.16**	2.33**	1.89*	2.04**	1.89*	1.13	0.79
F-value[b]	3.197**	3.217**	2.708**	2.197**	2.596**	6.087***	6.471***
χ^2(Hausman)[c]	62.17***	65.63***	46.67***	47.89***	45.65***	70.88***	71.23***
χ^2(White)[d]	15.773	15.444	16.227	16.280	16.234	15.973	16.102
χ^2(BP)[e]	3.681	1.799	6.842	6.400	6.805	4.532	4.764

Note: absolute value of t-statistics in parentheses; *, **, ***: statistically significant at 10, 5 and 1 %. Regression is estimated with robusterror syntax to control for autocorrelation.

[a]: Hausman test for simultaneity effect: The hypothesis of a simultaneous effect is not rejected if t-value is significant. [b]: F-test for joint significance of dummy variables: The hypothesis of unequal unobserved country-specific effects is not rejected if F-value is significant. [c]: Hausman test for misspecification: The hypothesis of correlation between the individual effects and the explanatory variables, or the regression is not misspecified, is rejected if the chi-square value is significant. [d]: White test for HS: The hypothesis of no heteroscedasticity is rejected if the chi-square value is significant. [e]: BP test for HS: The hypothesis of no heteroscedasticity is rejected if the chi-square value is significant. When the problem of heteroscedasticity appears, the robusterrors estimation is reported.

Table V.9 - Economic Growth, FDI and Trade Policy: FDI EQUATION

Dependent Variable: Growth of Real Stock of FDI

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$\ln(FDIStock_{-1})$	0.152	0.136	0.158	0.138	0.156	0.151	0.158
	(3.28)***	(2.92)***	(4.00)***	(2.98)***	(3.38)***	(3.50)***	(3.40)***
$\Delta\ln(GDPPC)$	1.318	1.321	1.181	1.211	1.067	1.019	0.906
	(2.99)***	(3.07)***	(2.15)**	(2.96)***	(2.57)**	(3.38)***	(2.79)***
$\ln(GDPPC_{-1})$	0.326	0.278	0.328	0.279	0.321	0.326	0.318
	(2.75)***	(2.07)**	(3.24)***	(2.09)**	(2.71)***	(2.88)***	(2.35)**
Ln(Open)	0.076	0.080	0.089	0.088	0.093	0.093	0.106
	(1.60)	(1.58)	(2.22)**	(1.77)*	(1.98)*	(2.15)**	(2.29)**
$\Delta\ln(HCapital)$	4.932	5.004		4.926		4.350	
	(1.95)*	(1.98)*		(1.97)*		(1.83)*	
$\Delta\ln(EduSpend)$			-0.030				
			(0.26)				
$\ln(EduSpend_{-1})$	0.012				0.0007		
	(0.52)				(0.03)		
$\ln(MVAPW_{-1})$		0.025		0.028			0.010
		(0.49)		(0.55)			(0.22)
DUM-INDO	-0.988	-0.865	-0.997	-0.885	-0.990	-0.973	-1.020
	(2.79)***	(2.61)**	(3.36)***	(2.71)***	(2.79)***	(3.12)***	(3.11)***
DUM-MALAY	-0.578	-0.514	-0.612	-0.524	-0.605	-0.585	-0.620
	(2.85)***	(2.52)**	(3.45)***	(2.60)**	(2.99)***	(3.10)***	(3.07)***
DUM-THAI	-0.655	-0.575	-0.682	-0.592	-0.678	-0.663	-0.703
	(2.76)***	(2.51)**	(3.24)***	(2.62)**	(2.86)***	(3.12)***	(3.12)***
R^2	0.360	0.360	0.352	0.372	0.358	0.391	0.365
t-value[a]	2.16**	2.33**	1.89*	2.04**	1.89*	1.13	0.79
F-value[b]	5.072***	5.086***	5.942***	4.802***	5.542***	3.925**	3.661***
χ^2(Hausman)[c]	74.109***	50.701***	12.943**	32.516***	37.137***	94.629***	90.178***
χ^2(White)[d]	12.867	13.865	12.504	14.737	15.719	16.214	18.858
χ^2(BP)[e]	5.234	5.524	7.419	6.562	4.184	2.598	5.209

Note: See Table 8

4.2 - Human Capital and FDI

Table V.9 reports the results of the FDI equation estimation. The impact of human capital is tested with four indicators: the growth rate of the human capital index Δln(HCapital), the growth rate and the level of real public spending on education Δln(EduSpend), ln(EduSpend) and the level of manufacturing value added per worker ln(MVAPW). The level of public spending on education and the level of manufacturing value added per worker are used with a lag of one year.

The index of human capital, which represents years of schooling attainment weighted by earnings of different educational groups, have statistically significant and positive coefficients (Specifications 1, 2, 4 and 6). This index could be regarded as a proxy for labour quality weighted by labour cost. The empirical finding suggests that labour quality, or the stock of human capital, is a positive determinant of FDI and that higher wages could indicate higher quality of labour. It confirms the postulation that foreign investors tend to prefer a location that can provide some skilled and semi-skilled labour at a reasonable cost, rather than a location that provides only cheap unskilled labour (Section 1.3.1). This could partly explain why the ASEAN countries could compete with other cheap-labour-cost countries to attract FDI despite having higher and increasing wages. In the 1980s, Singapore faced a tightened labour market and increasing wages. Singapore did not attempt to lower wages to attract FDI; instead the government strongly recommended companies to increase wages and considered this as a means of driving up workforce skill levels. Singapore also provides incentives for workers to acquire more training and knowledge[30]. Consequently, despite having higher wage rates than many other countries in the region[31], Singapore has been successful in attracting a large amount of FDI in the manufacturing sector and being upgraded to a higher level in the production chain with its high skill-level labour force.

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[30] See Section 2

[31] See Appendix V.5 for data on salaries and wages of selected Asian countries

Jobs in the manufacturing sector in Singapore are comparatively skill-intensive and Singapore has the highest ratio of manufacturing exports to total exports in the region[32]. The experience of Singapore shows that high wages could indicate higher skill levels. Chart V.2 shows that in Singapore, the manufacturing sector has higher average labour costs but also higher labour productivity than the national average.

Chart V.2 – Labour Cost and Productivity in Singapore (1992-1995)
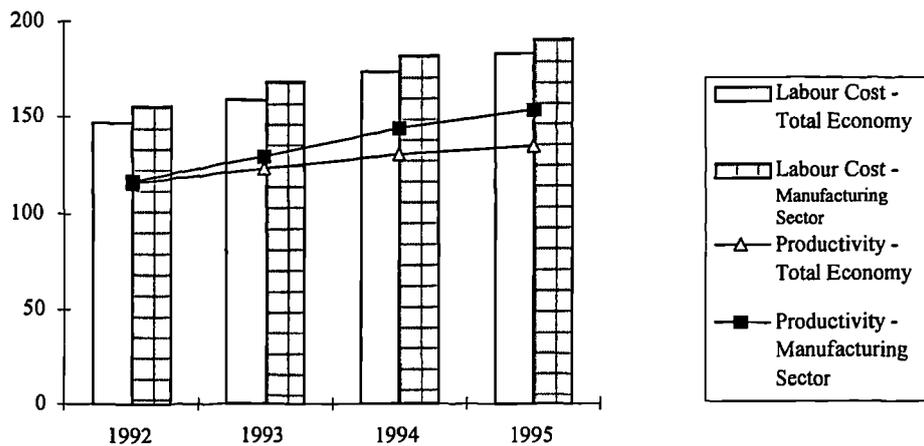
Source: UNIDO Statistics, www.unido.org

While the index of human capital has a significant impact on the growth of FDI, the growth and level of real public spending on education fail to have significant coefficients in all cases. That is, the stock of human capital influences the attractiveness of the country to FDI while public spending on education has no effect. The level of manufacturing value added per worker, which is used as an indicator for the skill level of workers, also fails to have a significant impact[33]. Although human capital is found to be a positive determinant of FDI, due to the problem of data availability the econometric estimation cannot provide solid evidence on whether or not human capital helped the ASEAN countries attract "higher-quality" FDI, i.e. FDI in technology- and skilled-intensive production. Data on manufacturing production and on exports of these countries, nevertheless, supports the hypothesis. Rapid increases in manufacturing

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[32] See Section 2, Chapter IV
[33] The impact of growth rate of manufacturing value added is also tested but fails to be statistically

exports, which are attributed substantially to FDI firms, have been observed in the ASEAN countries, especially since the late 1980s, when FDI into these countries increased rapidly[34]. FDI firms in Singapore and Malaysia, the countries with higher stocks of human capital, export electronics and electric products. Meanwhile FDI firms in Thailand and Indonesia, the countries with comparatively lower stocks of human capital, export labour-intensive products such as textiles and garments. This demonstrates that human capital could be attributed not only to increases in manufacturing production and exports by FDI but also to increases in higher value-added production and exports by FDI.

Overall the results of the empirical work reported in Tables V.8 and V.9 are consistent with the hypothesis that human capital is a positive factor in the two-way relationship between growth and FDI. Nevertheless the results suggest that each proxy represents only some forms of the stock of human capital and thus each proxy could be associated with growth and FDI in a particular way. In the growth equation (Table V.8), results from the estimation suggest that education spending has significant influence on growth rates of GDP per capita while the index of human capital, which is labour quality weighted by salaries exerts no significant impact. Meanwhile the results of the FDI equation (Table V.9) report the significant impact of the index of human capital and the insignificant impact of public spending on the growth of the FDI stock. A possible explanation for these findings is that only some forms of the human capital stock might show the statistical association with economic growth, and that the index of human capital, which is built on secondary schooling attainment, might not. In the ASEAN countries, skill development and retraining have recently been particularly emphasised. Secondary school enrolment might not, therefore, reflect improvements in skill levels while public spending on education might. Meanwhile, by taking into

significant (results are not shown).
[34] See Section 2, Chapter IV for more details.

account labour quality and labour cost, the index of human capital, rather than public spending on education, could have a more direct link with the decision-making process of foreign investors, and thus with growth rates of FDI.

5 - Conclusion

This chapter presents a theoretical framework for studying the role of human capital in the two-way relationship between economic growth and FDI. It hypothesises that human capital is a positive factor that facilitates this relationship. Human capital could improve the contribution of FDI to economic growth, especially FDI's contribution to productive capacity and to the shift toward technology-intensive and value-added production and exports. It could enhance the attractiveness of the country due to high economic growth and could help the country to attract the types of FDI that could promote higher economic growth. This hypothesis is tested for four ASEAN countries during 1975-1995. The empirical results do not reject the hypothesis. Human capital is found to be a positive and facilitating factor in the two-way relationship between economic growth and FDI in the ASEAN countries during 1975-1995. More specifically, real public spending on education and the productivity of the labour force, which are assumed to be important for technology transfer from FDI and for the shift toward higher value-added production and exports, are found to be positive factors that enhance the contribution of FDI to economic growth. The study also uses education attainment weighted by earnings of educational groups as another proxy for human capital, which is not only an indicator of labour quality but also of labour cost. Education attainment weighted by earnings of educational groups is found to be a positive factor determining the growth of the FDI stock. This finding confirms the postulation that foreign investors tend to prefer a location that can provide some skilled and semi-skilled labour force at a reasonable cost rather than a location that provides

only cheap unskilled labour force. It could also help explain why the ASEAN countries, especially Singapore could compete with other cheap-labour-cost countries to attract FDI despite having higher and increasing wages. Although human capital is not a sufficient condition for the two-way relationship between economic growth and FDI in the ASEAN countries during 1975-1995 to exist, the result suggests that human capital facilitated the implementation of EOR and enabled FDI to promote export-led and FDI-led growth in these countries.

Although the study attempts to use different indicators of human capital, some forms of human capital accumulation such as health and nutrition that could be associated with growth and FDI are ignored due to lack of reliable data. The results could be more meaningful if an inclusive index that considers various aspects of human capital was built and used. Also, lack of data about the sectoral pattern of FDI, technology transfer, production and exports by FDI firms and employment in FDI firms prevents further analysis on the channels through which human capital could influence the relationship between economic growth and FDI.