Measures to Attract FDI

A Case Study of Some Asian Countries

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ABSTRACT

Previous literature reviews suggest that foreign direct investment (FDI) inflows have a positive impact on economic growth for host countries. If we want to improve the economic performance of the host country, one possible way is to attract more FDI. In this case, we need to know which factors could attract FDI into the home country.

Using Panel Data methods, for China, India, Korea, Singapore and Malaysia I wide verify whether FDI determinants are significant or not for these countries. The reason for using these countries is that they are all developing countries in Asia, so it may have implications for the rest of Asian countries as well as other developing countries. For FDI determinants, I will use market size, relative labor cost, growth rate, trade intensity and population in the economy.

The estimated results are consistent with the previous literature and suggest that relative labor cost is the most important factor attracting FDI.

1. INTRODUCTION

According to Imad (2002), foreign direct investment (FDI) is the process whereby residents of one country (the source country) acquire ownership of assets for the purpose of controlling the production, distribution and other activities of a firm in another country (the host country). The international Monetary Fund's Balance of Payments Manual defines FDI as "an investment that is made to acquire a lasting interest in an enterprise operating in an economy other than that of the investor, the investor's purpose being to have an effective voice in the management of the enterprise" (IMF: BPM5, 1993). The United Nations 1999 World Investment Report (UNCTAD, 1999) defines FDI as "an investment involving a long-term relationship and reflecting a lasting interest and control of a resident entity in one economy". The term "long-term" is used in the last definition in order to distinguish FDI from portfolio investment, the latter being characterized by short term in nature and involving a high turnover of securities.

In today's global economy, one of the most salient features is cross-border investment by multinational firms. Cheng and Kwan (1999) pointed out that a lot of countries see attracting foreign direct investment (FDI) as an important element in their strategy for economic development because FDI is widely regarded as an amalgamation of capital, technology, marketing, and management. An important question for policy makers is what the factors that attract FDI are.

Many developing countries have made a remarkable transformation from being

hostile to foreign direct investment in the 1960s and 1970s to eagerly attracting it in the 1980s and 1990s. A celebrated example is China, which had virtually no foreign investment in the 1970s but now is a major host country of FDI. Studies such as Lardy (1992) and Wei (1996) have shown that foreign-invested firms have contributed significantly to China's impressive export expansion and to China's overall economic growth.

Although there are a lot of studies on FDI inflows and its positive effects on economic growth, such as Lunn (1980), Bagchi-Sen and Wheeker (1989) Coughlin, Terza, Arromdee (1991). There are only few studies on the FDI determinants among Asian countries, such as Kidron (1965), Huang (1998). These countries are prior important destinations for foreign investors since they have low labor costs and large market sizes. It is thus relevant to investigate more precisely the factors that attract FDI in Asian countries.

The second part of this paper reviews the literature and the factors that attract foreign direct investment in the Asian countries. I focus on the background of FDI in five Asian countries. The main hypotheses tested based in previous studies are whether market size, the relative labor cost, the growth rate, the trade intensity and population are significant factors in attracting FDI in these countries. I discuss the results from the literature and the factors through which they could attract additional FDI into their land. The determination of the factors may help design better policies affect the relative labor cost.

The third part of the paper discusses the data and methodology of my

estimation analysis. I collected data for five countries, China, India, South Korea, Singapore and Malaysia, covering the period 1987 to 2004 and used pool regression technique.

In the fourth part I report the general regression results for these countries. The results may have implications for developing countries, especially Asian countries for their policies in order to attracting more FDI.

In the last part, I conclude that the results suggest that market size, growth rate and trade intensity have a positive effect on FDI inflows, but the relative labor cost has a negative effect on FDI inflows. For the population size, the estimation coefficient is not significant.

2. LITERATURE REVIEW

2.1 Types of FDI

There are two types of FDI, horizontal FDI and vertical FDI. Horizontal FDI is foreign investment in the same industry that the firm operates at home. Vertical FDI is divided between backward FDI and forward FDI. In backward FDI, a foreign-based plant provides input into a firm's domestic production process. In forward FDI, a foreign-based plant assembles use the intermediate goods of a firm's domestic production. The main differences between horizontal and vertical production

strategies lie in the time sequencing and the substitutability. With horizontal production, global demand is met by production in both countries. The various plants produce perfect substitutable goods to the own country production, so that FDI is a substitute to trade between the two countries, which leads to a decline in trade. Vertical production always involves several steps to finish the good production, from raw material, to intermediate goods, to final goods. There is very limited substitutability between the outputs produced in the various production stages, so that FDI is a complement to trade and increase the total volume of trade between countries, which leads to export and import between both countries.

2.2 The Spillover Effects of FDI in Host Countries

FDI can stimulate economic growth through the creation of dynamic comparative advantages that lead to new technology transfers, capital formation, human resources development and expanded international trade (Chudnovsky and López, 1999). Nair-Reichert and Weinhold (2001) have argued that vertical FDI increases international integration and interdependence, facilitates the trade of goods, services and knowledge, and allows countries to specialize more effectively, thus increasing the benefits of comparative advantage and economies of scale. Furthermore, they hold that both horizontal and vertical FDI also increase productivity, widen the scope of competition, and spur the economy of host countries.

Bende-Nabende (1999) concludes that the factors through which the spillover effects of FDI act to bring about economic growth are interlinked and complementary

and thus cannot be discussed separately. The interaction is such that gains in one factor may stimulate improvement in one or more of the others, thus stimulating further synergies.

Douglas and Robert (1993) point out that it is difficult to predict in general the likely effect of FDI on developing countries. These effects vary from country to country, by industry, even by company and over periods of time.

Some recent studies have argued that the contribution of FDI to growth is strongly dependent on the circumstances in recipient countries. Balasubramanyam *et al* (1996) find that the effect on growth is stronger in countries with a policy of export promotion than in countries that pursue a policy of import substitution. In another paper, Balasubramanyam *et al* (1999) finds that effectiveness of FDI depends on the stock of human capital in the host county. Only in countries where human capital is above a certain threshold does FDI positively contribute to growth.

As show above, there are a vast number of empirical studies on the spillover effects of FDI on the growth rates of the host countries, though most of them focus on the effects of the total FDI on the economic factors and economy growth rates. Few of provide a sectors approach by focusing on how FDI in different sectors influences the host countries' economic growth, which is an important issue in our study.

2.3 Empirical Studies on the Determinants of FDI

Balasubramanyam and Mahambare (2003) working paper is said to be the origins of the theoretical literature on determinants of FDI. Their study states that

firms go abroad because of the advantages they possess. These advantages include patented technology, team specific managerial skills, marketing skills and brand names.

Firms incur signified costs of doing business abroad relative to domestic firms in those countries. Therefore, for a firm to become a multi-international, it must have offsetting advantages. Dunning (1981) has classified these advantages as follow ownership advantage, location factors and internalization factors. This is the so-called OLI paradigm. Ownership advantages mean that the firm must have a product or a production process such that the firms enjoy some market power advantage in foreign markets. Local-advantage are those factors that motive a firm to local product abroad rather than trading in the own country, especially if there are scale economics at the plant level. Internalization factors mean foreign production occurs within the firm—an internal market is created between parent and affiliates to control key sources of competitiveness or to reduce the risk that the firm might lose control of knowledge or technology which would happen through licensing. The OLI framework explains that FDI originates in the source country because it possesses ownership and internalization advantages and locates in another country because it possesses locational advantages.

A demand-supply framework sees the ownership and internalization advantages as the supply-side factors of FDI and location advantages as the demand-side factors of FDI. By studying the supply and demand the theory investigates the determinants of FDI.

Another frequently mentioned theory looks at re-export-oriented (also called vertical) and market-oriented (also called horizontal) FDI on the basis of multinationals' motivations, where the former is connected with wage costs and factor endowment differences across countries while the latter is connected with factors like transportation costs and locating production close to the consumers in the overseas markets.

More relevant to our study is the location theory, which is often used to explain why a Multinational Corporation (MNC) would choose to invest in a specific location within a particular host country. Previous researchers have identified quite a few determinants for the location of FDI.

In their study on state characteristics and the location of FDI within the US, Coughlin et al. (1991) assume that a foreign firm will choose to invest in a particular state if and only if doing so will maximize profit. The FDI in a particular state depends on the levels of its characteristics that affect profits relative to the levels of these characteristics in the other states. They identify state land area, per capita income, agglomeration, labor market conditions, wage rate, the degree of unionization, the unemployment rate, transportation network, taxes and the state expenditures to attract FDI as the determinants of FDI across the states within the US.

Similarly, Bagchi-Sen and Wheeler (1989) find that population size, population growth, and per capita retail sales are important determinants of the spatial distribution of FDI among metropolitan areas in the US. Friedman *et al.* (1996) find that market potential, wage, skilled labor measured by per capita number of scientists

and engineers, construction cost, the presence of a major port, and funds spend on attracting FDI have significant impact on the location of foreign branch plants in the US. Table 1 below summarizes the previous literatures on the sign of the FDI determinants. I expect to get the same qualitative results in my empirical study.

Table 1 Previous Studies for the sign of FDI determinants

Potential FDI determinants	Positive	Insignificant	Negative
Market Size	Bandera and White (1968) Kwack (1972) Ahmed (1979) Agarwal (1980) Dunning (1981) Nigh (1985) Tsai (1994)		
Labor Cost		Davis and Lyons (1991) Arestis and Mariscal (1997)	Caves (1974) Borensztein (1998) Zhang (2001) Kucera (2002) Haaland and Wooton (2003)
Openness	Kravis and Lipsey (1982) Culem (1988) Tsai (1994) Shamsuddin (1994) Edwards (1998)	Wheerer and Mody (1992) Dollar (1992)	
Growth Rate	Bandera and White (1968) Lunn (1980) Schneider&Frey(1985) Culem (1988) De Mello (1997)	Nigh (1985) Tsai (1994)	

Comment: If the market size and growth rate are significant because they measure horizontal FDI. Most of determinants measure horizontal FDI.

A large market size can attract more horizontal FDI in the host country, and have a positive sign is expected. More open is a country, more attractive is for vertical FDI. Labour cost however implies a negative impact on FDI.

2.4 Background of FDI in Asian Countries

Nowadays most of the world FDI outflows are among developed countries. However more and more FDI is going to developing countries. "Developing countries have received about 20% of total world FDI flows in 1980s, meanwhile during 1992-1994 this number went up to 32% and reached 37% in 1997" (UNCTAD, 2001). For the past several decades, the FDI inflows in developing countries have increased significantly. "Between 1986 and 1997 the FDI inflows increased from $10 billion to $96 billion in developing countries and this accounted for about 37 percent of "total net foreign resources flows" to developing countries in 1997" (Perkins, Radelet and Lindauer, 2001 page 182).

Since the 1980s, FDI flows into Asia have played important roles in promoting trade and economic growth in a number of countries in the region. FDI inflows, however, have tended to be concentrated in only a few countries in the region. During the 1990s China has absorbed a large share of the inflows. FDI inflows to developing Asian countries picked up to US$ 52 billion in 2001, following three consecutive years of decline, but it was largely due to strong inflows into China alone. FDI inflows to China exceeded US$ 30 billion in 1993 and were in the range of US$35-45 billion before reaching a new peak of US$ 47 billion in 2001.

2.4.1 The Background of FDI in China

In 1979 when China decided to open the country to foreign investment it had virtually no legal or regulatory structure to support foreign investment. Over years, however, the Chinese government has developed a system of laws, regulations, incentives and policies to encourage foreign investment in particular during the past 15years. These include slashing corporate tax rates, permission of foreign investment in all sectors including nuclear power, no pre-set ceiling on foreign equity holdings, single window[1] permits and freedom to hire and fire in joint ventures.

Much of foreign investment in China in the early 1980s flowed into large joint venture tourist hotels and other services for foreign travelers. Starting from 1991, foreign investment has been more in the areas of manufacturing and real estate, especially in the coastal provinces, and special economic zones. China has consistently preferred foreign investment in manufacturing and in industries which are export oriented or that involves technology new to China. At the end of 2002, China had approved 24930 units of projects for a total volume of $59.26 billion.

2.4.1.1 Empirical Studies on the Determinants of FDI in China

Wang and Swain (1995) in their comparison between China and Hungary found that market size, cost of capital, and political stability are significant determinants of FDI in both countries.

[1] Single window refers to the ability to provide multiple displays via a single terminal.

Wei's (1996) model looks at log FDI as a function of log GNP, log Distance and Literacy based on city-level data. He found that FDI is associated with cross-city differences in growth rates, that foreign invested enterprises had a higher propensity to export than the average Chinese firm, and that there was a positive association between township and village enterprises growth and FDI.

Liu, Song, Wei and Romilly (1997), in examining country characteristics and FDI in China, found that inward FDI into China is determined by relative real wage rates, relative exchange rates, economic integration based on real imports and exports, and that inward FDI was determined by relative market size and total cultural differences.

Broadman and Sun (1997), in their econometric analysis on the spatial distribution of FDI in China, found that FDI stock in 1992 was determined mostly by GNP, infrastructure development, levels of illiteracy, and coastal location.

Chen (1995) in his analysis of FDI inflows to Chinese provinces, found 'efficiency wages' (nominal wages divided by average productivity) to be negative and statistically significant, and transportation infrastructure to be positively significant determinant of FDI inflows.

Coughlin and Segev (2000) in their analysis found that GNP, average productivity, and coastal location were positive determinants of FDI location with average wages, illiteracy rate, found to be negative determinants as expected. They also tested transportation infrastructure in the form of paved roads and air-staff. Both were found to be positively related to FDI but not significant. Coughlin and Segev

also emphasized the specific nature of geographic data, agglomeration of FDI and spillover effects, and tested accordingly, finding that spatial dependence existed.

Another econometric analysis on the regional distribution of FDI in China by Yingqi, Liu, Parker and Vaidya (1999) found that FDI was positively influenced by international trade, lower wages, R&D manpower, higher GDP growth rates, preferential investment policy, quicker improvements in infrastructure, more rapid advances in agglomeration, and closer links with overseas Chinese.

Huang (1998) and Sun (1998) examine the characteristics and patterns of FDI in China with respect to economic development and growth from a general perspective. They emphasize a number of factors, such as low wage costs, low material costs, an abundant supply of labor, low transport costs, psychic distance in the form of culture, customs, and language, and pro-business environment developed by the government in the form of fiscal incentives for locating in specific locations open for FDI.

Henley, Kirpatrick and Wilde (1999) examine trends and policy issues, nothing that the emphasis on imports processing and exports diminish the development of indigenous linkages, and the financial incentive approach means taxes forgone. They argue in favor of the removal of all incentives, improved administrative efficiency, and increased FDI to be focused on the large infrastructure projects.

Including market size, labor costs, labor quality, agglomeration effects, transportation network, FDI incentives measured by a dummy variable, cultural and historical links, and openness of China's domestic market to FDI as independent

variables, Zhang's (2001) paper points out that China has become quite attractive to multinational corporations due to its liberalized FDI regime and huge market, along with improving infrastructure conditions. Besides, according to Zhang, different from many other host countries, "hometown connections" have played a critical role in substantial flows of investment into China by overseas Chinese firms.

Sun, Tong, and Yu (2002), motivated by Naughton's work, use China's provincial data and distinguish their study from similar studies by examining changes in importance of FDI determinants through time. Due to the change of the relationship of wage with FDI and the change of the relationship of provincial GDP with FDI around 1991, they believe the nature of FDI in China has shifted over time. Before there is only a few FDI inflow in China because low labor quality. Right now they find high labor quality and good infrastructure attract foreign investors. They also find that the cumulative FDI relative to cumulative domestic investment has a negative impact on the new FDI because new-coming multinational corporations may choose to invest in provinces with fewer FDI competitors. However, their result explains the FDI distribution in the coastal provinces better than it does for Central and Western provinces.

Singh and Jun's (1995) study elaborate an interpretative model of FDI in China from the perspective of economic policy. The principal conclusions of the empirical investigation included in their study stem from a methodological focus in which both macroeconomic determinants and sociopolitical factors that bear upon the flow of FDI towards China are taken into account. They point out sociopolitical

instability, the business operating context, and the degree to which the economy is geared towards export markets. They also include other variables as controls in order to verify their hypotheses. These variables include the size of the market, labor costs, exchange rates, and the characteristics of the investor's country of origin, the relative importance of the exports sector in the country receiving investment, and the amount of FDI during the preceding period. Their methodology recognizes the importance of both these economic factors and the sociopolitical elements mentioned.

2.4.2 The Background of FDI in India

India does possess a large domestic market, it has achieved growth rates of around 5 to 6 percent per annum in recent years and its overall record on macroeconomic stability, save for the crisis years of the late eighties, is superior to that of most other developing countries. It is, however, India's trade and FDI regimes which are seen as major impediments to increased inflows of FDI (Leichenko and Erickson, 1997).

Two distinct phases can be identified in India's foreign trade and investment regimes- the pre 1991 reforms phase and the post 1991 phase. The pre 1991 phase, which stretches over four decades, was marked by extensive regulation of trade and investment. The cumbersome and complex nature of the regulatory framework during these years has been extensively analyzed (Kidron, 1965 and Kumar, 1994). "Neither technical nor financial participation was allowed to reflect the desire to restrict foreign

ownership and control to sectors of the economy in which its contribution was deemed to be essential. Restrictions on ownership of equity by foreign firms in cases where projects involved substantial inputs of foreign exchange or were export oriented, also reflect the desire to limit foreign control, but at the same time take advantage of FDIs foreign exchange earning potential where necessary and possible" (Chakraborty and Basu, 2002 page 1066).

Table 2: Foreign Collaboration Approvals, 1948-1993

			Those with foreign equity		
	Period	**Average number of collaborations approved per year**	**Average Number per year**	**Proportion in total**	**Average foreign investment per year (Rs million)**
Pre 1991	1948-58	50	n.a.	n.a.	n.a.
	1959-66	297	108*	36.4	n.a.
	1967-79	242	39	16.1	53.62
	1980-88	744	170	22.8	930.84
	1989-90	635	194	30.6	2,224.95
Post 1991	1991-93	1,315	589	44.8	44,280.40

Note: n.a. – not available, * based on the basis of 1961-66
Source: Kumar (1994)

The growth in the number of foreign collaboration agreements approved over the years (Table 2) and the proportion of foreign equity participation in Indian industry reflect the 1991 economic reforms were to change all this. "Along with the virtual abolition of the industrial licensing system, controls over foreign trade and foreign investment were considerably relaxed, including the removal of ceilings on

equity ownership by foreign firms. The reforms did result in increased inflows of FDI during the decade of the nineties. Even so, the volume of FDI in India is relatively low compared with that in the East Asian countries and China. This relatively low volume of FDI, especially in comparison with China, has attracted widespread comment and sweeping policy recommendations for increasing the volume of FDI in the country." (Balasubramanyam, Salisu and Sapsford, 1999 page 30)

2.4.2.1 The Empirical Study on the Determinants of FDI in India

Partly relied on Dunning's eclectic theory, Yogarajah (2001) investigate the factors that explain why India is or is not able to attract investors. He stated that although the cost of labor in India can be said to be comparatively low, the quantity of labor is relatively low since work has only a 30% stake in a person's life in India and the quality of labor is not quite favorable because many of Indian graduates and professionals have left the country for greener pastures in USA and elsewhere. He finds the size of potential market is large but the purchasing power of the population is low. The Indian Government has offered a large number of incentives in an attempt to attract FDI into India but what was promised on paper was not or was too difficult to put into practice. Different from many other similar studies, Yogarajah believes that non-labor resources in India are not so low as they appear to be and the conception that India is a politically unstable country due to the frequent elections and change in Government is misleading. He comes to the conclusion that India's positive

steps towards liberalizing her economy has been done in total disregard to the other factors that motivate FDI.

Venkataramany (1999) explores the factors such as firm size, profitability, trade, interest rates, economy and inflation which contribute to the explanation of FDI in India and tests whether the variables do really influence the flow of FDI into India. In his basic model on the determinants of FDI to India, Venkataramany finds inflation has an adverse effect on the inflow of FDI to India. He concludes that although India has not been subjected to banking or financial crisis due to its highly conservative approach, significant policy changes should be pursued in monetary management, internal debt management, capital market, trade and foreign exchange market.

Balasubramanyam and Mahambare (2003) argue that India possess a large domestic market, has had relatively good stable growth rates in recent years and an overall record on macroeconomic stability superior to many other developing countries, all of which provide a favorable environment for FDI.

As show above, the empirical literature on the determinants of FDI to a host country is vast, however, only few studies compare determinants across developing countries. In this paper, I am going to do that.

2.4.3 The Background of FDI in South Korea

Korea's encouragement of foreign direct investment has been viewed as a contributing factor to economic growth overall and in particular, in the machinery industries. "Korean manufacturing has not only grown remarkably, but has also

undergone substantial structural changes with the nonelectric machinery, electric machinery and transportation equipment industries expanding especially rapidly in 1974-1986." (Lee and Ramstetter, 1991 page 108)

According to Lee and Ramstetter, two factors stand out in any attempt to describe the fluctuations in FDI inflows over time: (1) fluctuations in Korean economic activity, and (2) major changes in Korean economic policy. For example, in 1979-1980, there was a large downturn in FDI inflows. This period was characterized by a faltering economy and political turmoil following the death of former President Park Chung Hee. "The influence of politics and policy on FDI flows is also seen in the two largest investment booms, the first in the early 1970s and the second in the mid-1980s. The first boom was related to a number of external factors, most notably the first steps toward liberalization of FDI abroad by the Japanese combined with growing Japanese confidence in the potential of Korean investments. The boom in the mid-1980s is also clearly related to the liberalization of FDI regulations that preceded it. For example, changes in labor costs, capital costs, and human capital costs. Exchange rate fluctuations and protection of the Korean market are also relevant factors. In summary, the health of the Korean economy and Korean policy, have had undeniably large influences on the fluctuations of FDI over time." (Lee and Ramstetter , 1991 page 112-113.)

2.4.4 The Background of FDI in Singapore

Singapore is considered to be a highly attractive site for multinational

corporations (MNCs) location because of their considerable human capital, developed physical infrastructure, and strategic geographic location. "In 1990, Singapore's GNP per capita was $11,160 - thus qualifying them as high-income industrial economies, according to the World Bank's definition." (Clark and Chan, 1995 page87)

Singapore shows a good example of "plan rationality" whereby government agencies and public enterprises play a very important role in developing infrastructure, mobilizing resources and making long-range preparation for orderly transition to higher stages of the international product cycle. "Government bureaucrats engage in thorough examination and detailed analysis of socioeconomic conditions and potential courses for economic development and plan with a view to getting things right the first time." (Clark and Chan, 1995 page 88)

2.4.5 The background of FDI in Malaysia

Malaysia was the second fastest growing economy in the South East Asian region during 1980's. Since its independence in 1957, Malaysia has moved from an agriculturally based economy to a more diversified and export oriented one. "The Malaysian market is fairly openly oriented, with tariffs or averaging approximately fifteen percent and almost non-existent non-tariff barriers and foreign exchange controls. The open trade based economy is supported by the fact that the total two way trade almost amounts to 120 percent of the GNP (1994)." (Olsson, 1994)

Until 1993, foreign investment contributed 60% of all investment in Malaysia. FDI grew strongly in the late 1980s to reach a peak of RM17.7 billion in 1992. This was followed by a sharp drop to RM6 billion in 1993 due to the world recession, but rose again to RM15.2 billion in 1994. Malaysia is among the top five recipients of foreign direct investment in the world. (McLeman 1994, 19).

3. DATA AND METHODOLOGY

3.1 Model of Estimation

From the discussion of Part 2, the most relevant theory to my study is the location theory. This theory is often used to explain why a Multi-National Corporation would choose to invest in a particular host country. It can also explain why a foreign firm invests in a specific location within a particular host country. Dunning's OLI framework explains that FDI originates in one country because it possesses ownership and internalization advantages and locates in another country because it possesses locational advantages (Little risks or lots of barriers in export markets or availability of low cost labor or natural resources).

A demand-supply framework considers the ownership and internalization advantages as the supply-side factors of FDI and location advantages as the demand-side factors of FDI. I will study the demand-side factors of the theory.

3.2 Choice of Variable

To find the determinants which could attract FDI into the developing countries, I choose five variables because previous studies mentioned many times. These five variables are Market Size (MS), the Relative Labor Cost (RLC), the Growth Rate (GROWTH), the Trade Intensity (Trade) and the Population (POP).

- **Market Size (MS)**

An important factor affecting revenue of a multinational firm is market size of a country, particularly for the market-oriented horizonital FDI that aims to gain access to local markets. A number of studies (Agarwal, 1980; Jaumotte, 2004; Zhong, 2005; Physica-Verlag, 2006) revealed that foremost among the determinants of inwards FDI is the attractiveness of the market. Tsai's (1994) study showed that market size is one of the key determinants of FDI, though economic growth and labor cost are also important. Milner and Pentecost (1996) also noted that for a given location, advantages of a large market size generate more inward investment.

The market size of a region can represent the economic condition and potential demand of output in the region. The foreigner investors, who target the local market rather than exporting the output, regard carefully the size of host market. Usually, Gross Demand Product (GDP) can be used to capture the size of host market. Following Cheng and Kwan (1999), regional FDI is proportional to the regional GDP, and the larger the market size of a country, the more FDI is likely to be received in that country. According to Mansur (2001), host country market size, as measured by

its GDP, was determined as the single most important factor in the investment location decision of the firm: the larger the market, the greater the FDI inflow, other things equal.

- **Relative Labor Cost (RLC)**

Purchasing power parity (PPP) is a theory of long-term determination of exchange rate and a way to compare the average costs of goods and services between countries. Based on the definition of the PPP, the PPP conversion factor provides a measure of the difference between the price level of a country and that of the United States. The price difference is known to be related to the level of per capita income according to the Balassa-Samuelson theory. Poor countries have lower prices than rich countries. When this PPP conversion factor is regressed on per capita income measured in current international dollar in a quadratic functional form, the residuals from the regression can be regarded as an indicator of relative labor cost, to the extent that the prices of nontradable goods and services are proportional to wage rates. This indicator will serve as the labor cost advantage indicator in my final regression. I used the PPP conversion factor as my dependent variable which is regressed on per capita income measured in current international dollar in a quadratic functional form:

$$PPP = Constant + \alpha * Income + \beta * Income^2 + Error$$

Here, I use five country's data into this equation to obtain result estimates. The regression results for the above are α= -0.938654; β = 0.062802; Constant=3.906974. Then I record the error term of my five sample countries by substituting five countries

data into the estimated equation and record each error as my residual labor cost. I put the residual labor cost table in Appendix 1.

It is believed that foreign investors generally aim to take advantage of cheaper labor inputs in a country, particularly cheaper labor for the export-oriented FDI in which production is labor-intensive. There have been many studies (Caves, 1974; Borensztein, 1998; Zhang, 2001) on the negative impact of wage rate on the attractiveness of FDI. A higher wage rate means that labor cost is high and hence increases production cost. However, the same studies show that a too low wage rate would not attract more FDI, because a too low wage rate is often associated with low productivity. Thus, the effect of wage on FDI has been somewhat controversial.

- **Growth Rate (GROWTH)**

The role of the growth rate in attracting FDI is obviously important. The rapid growth rate of a country means that a better investment environment is available. Bandera and White (1968), Schneider and Frey (1985), Lunn (1980), Culem (1988) and De Mello (1997) show that high growth rate attracts FDI. Tsai (1994) obtained strong support for the hypothesis over the period 1983-1986 but only a weak link over the period 1975-1978. On the other hand, Nigh (1985) got weak positive correlation between growth rate and FDI in developing countries but weak negative correlation between growth rate and FDI in developed countries. Since developed countries already have higher growth rate, they will grow relatively slower than developing countries.

- **Trade Intensity (trade)**

The World Development Index (2006) defines trade intensity as the sum of merchandise exports and imports divided by the value of GDP, all in current U.S. dollars. The trade intensity ratio has been widely used as an indicator for the policy environment. The larger the ratio is, the more open the economy is. In turn, a more open economy is considered more attractive to FDI, other things being equal. Culem (1988) Tsai (1994) and Shamsuddin (1994) obtain significant and positive coefficients. The hypothesis here is that higher trade intensity is indicative of a more open economy and is therefore likely to attract vertical FDI.

- **Population (POP)**

Bagchi-Sen and Wheeler (1989) find that population size is also an important determinant of the spatial distribution of FDI among metropolitan areas in the US. The larger the population is, the larger is the potential to increase the size of the market. So the hypothesis is that a larger population may also attract more FDI.

3.3 Data Description

In this section I describe the data. The data covers five Asian countries: China, India, Singapore, South Korea and Malaysia for the sample period 1987 to 2004. The data are on an annual base and was obtained from World Development Indicator (WDI)[2]. Table 3 summarizes the statistics of my dataset.

[2] WDI publication is the Word Bank's premier annual compilation of data about development.

Table 3 Summary Statistics

		FDI (US dollars Billions)	GDP (US dollars Billions)	RLC (Ratio)	GROWTH (Average Rate)	TRADE (Ratio)	POP (Millions)
China	mean	29.6	848	-0.22933	9.952223	0.386566	1200
	Std	19.3	511	0.056378	1.653945	0.075668	67.4
India	mean	2.23	391	-0.23645	5.687249	0.172542	940
	std	2.04	124	0.053009	0.606977	0.038254	88.2
Korea	mean	3.08	414	0.078429	7.235019	0.562506	45.1
	std	2.99	152	0.141690	2.022945	0.072219	2.12
Malaysia	mean	3.26	74.3	-0.03651	6.420406	1.574327	20.7
	std	1.64	26.2	0.095408	2.516964	0.308030	2.7
Singapore	mean	8.64	68.6	0.312476	7.020584	2.919732	3.57
	std	5	27.5	0.186081	1.999762	0.232895	0.5

From Table 3, we can see the mean of FDI in China is 29.6 billion, which is the largest number of the five countries. The standard deviation[3] of FDI is 19.3 billion which is larger than in other countries. This could suggest that China's FDI

[3] The standard deviation is a standard statistical measure of the variability of a set of numbers. The larger it is, the more variable the series is. However, we should be a little careful comparing the SD of GDP across countries, because countries with a smaller GDP are likely to also have a smaller SD of GDP. For this reason, sometimes a measure called the coefficient of variation (SD divided by the mean) is used for such comparisons instead.

increased a lot during 1987-2004. The mean of GDP in China is 848 billions, which is also largest of the five countries. The standard deviation for China's GDP is 511 billion. It is also large. A large standard deviation for China's GDP could mean China's GDP is growing fast over time. From this observation, GDP seems to have positive effect on the location of FDI. Increase GDP of the country can also increase FDI inflow into the country.

China's population is 1200 million, which is larger than any other countries. Singapore with a population of 3.57 million is the smallest of the five countries, but has the second largest FDI. From this observation, the impact of population on FDI is unclear.

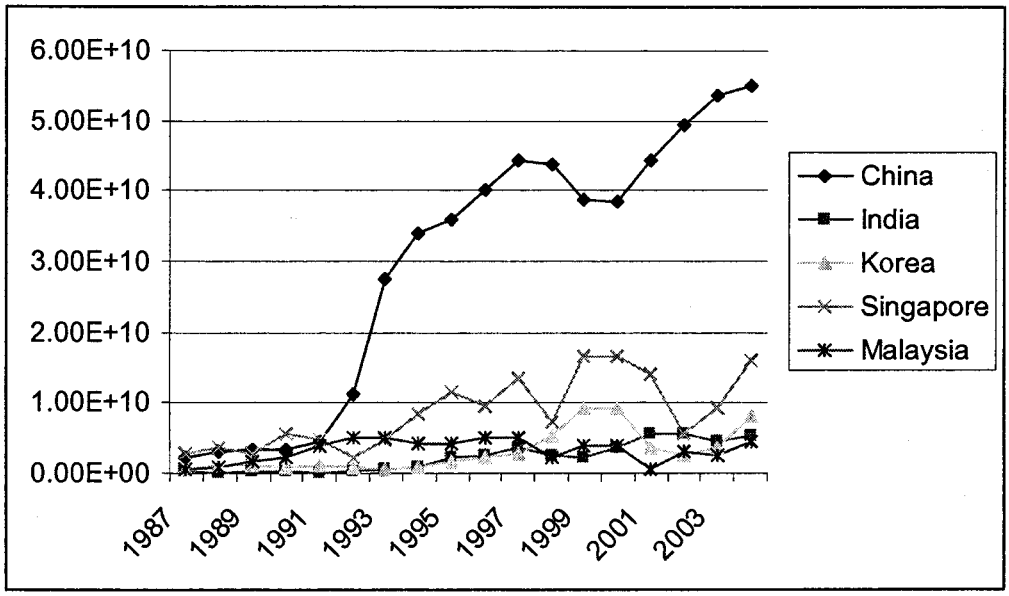
The relative labor cost indicator is the cost relative to the average of the five countries. Compare to the average labor cost to each country, the relative labor cost of China is -0.23645, which means almost 24% below average. However, the relative labor cost of Singapore is 0.312476 which means 31% higher than average 55% above China. Despite this, FDI in Singapore is significant given the size of the country, as FDI inflow in Singapore is the second largest of the five countries. It seems that Singapore has many other advantages, like highest trade intensity and higher growth rate.

Singapore and Malaysia are more open economy than other countries. They both have trade intensity ratio. Singapore is 2.919732 and Malaysia is 1.574327. It is expected that a more open economy would attract more vertical FDI.

In my paper, I use the net FDI inflow as my dependant variable. "Net inflow is

the net inflows of investment to acquire a lasting management interest (10% or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings and other long-term capital as shown in the balance of payments" (Wei, 1996). Gross FDI reflect the sum of the absolute value of inflows and outflows in balance of payment in financial accounts. We choose the net inflow here.[4] I measured all the five countries into US dollar to make my data comparable. Figure 1 shows the trend of FDI from year 1987 to 2004. From Figure 1, we can see that FDI into China has grown rapidly. The second fastest trend is in Singapore. The FDI trends in the other three countries are relatively stable.

Figure 1 Trend of FDI



[4] A limitation of the Gross FDI is that it may overestimate the amount of "new capital" in the economy. Carkovic and Levine (2002) use gross FDI inflows.

As I mentioned above, I use GDP as my Instrument Variable for Market Size. I also convert all the five GDP into US dollar to make my data comparable. In the WDI, I chose the current US dollar GDP as my regression variable. Figure 2 is the trend of Market Size (GDP) of the five countries from the year 1987 to 2004. From Figure 2, we can see GDP of China has grown faster than other countries.

Figure 2 Trend of Market Size (GDP)

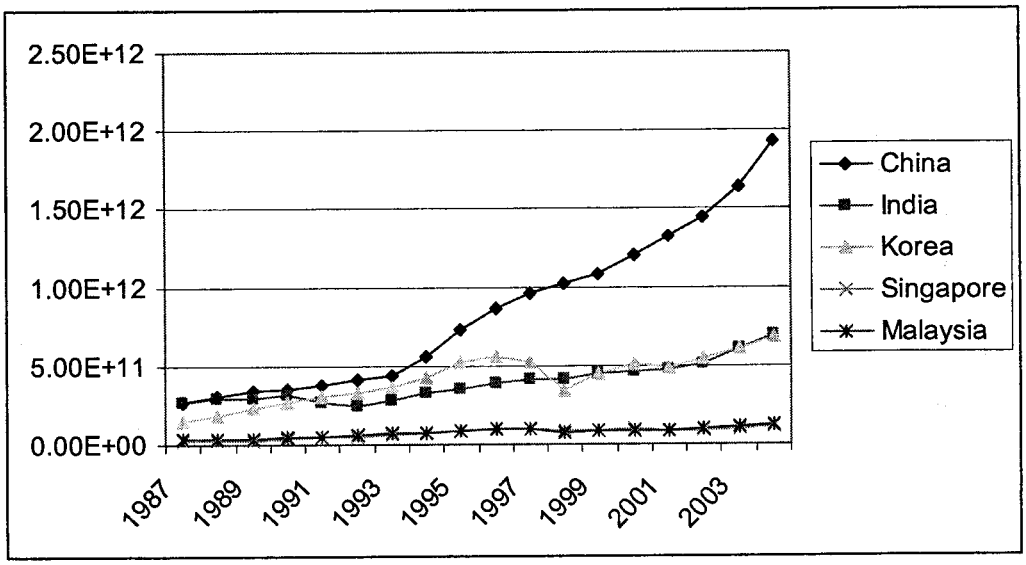
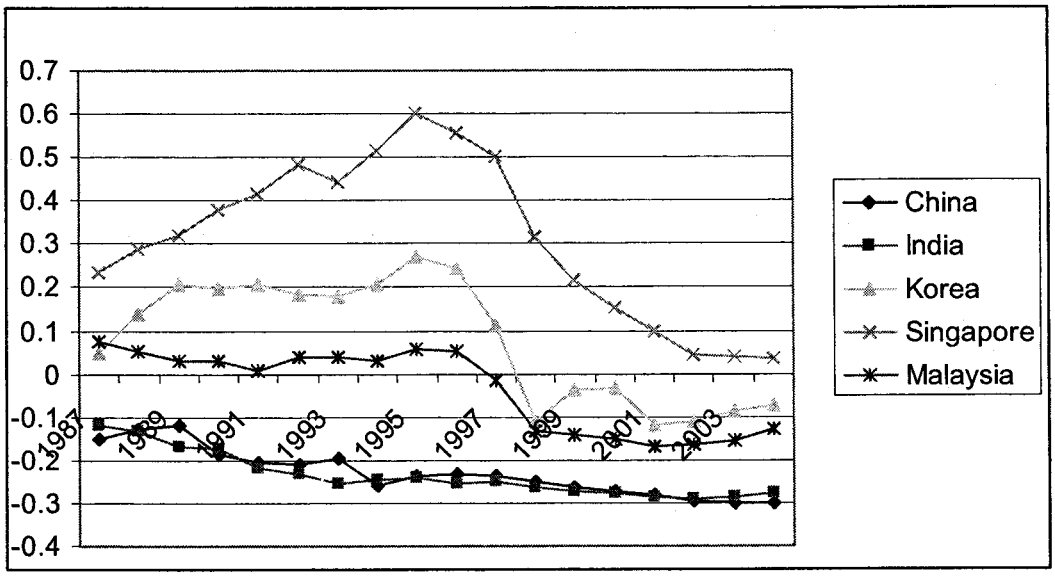


Figure 3 shows the trend of Relative Labor Cost from year 1987 to 2004. From Figure 3, we can see that China and India have relatively low labor cost. Singapore has relatively higher labor cost, especially during the period 1994-1998.

Figure 3 Trend of Relative Labor Cost



I use the lagged average growth rate of real GDP in the previous five years to stand for my growth rate variable. I use the lagged average rather than the current growth rate to avoid the endogeneity problem. Instead of collecting the data from 1987 to 2004, I collected the data from 1982, as I need to calculate the average growth rate of GDP on previous five years in order to avoid the endogeneity problem.

For trade intensity, I use the sum of merchandise exports and imports divided by the value of GDP. Both of the above are from the World Development Indicator 2006.

4. ESTIMATION RESULTS

4.1 Regression Equation

I use Panel Data methods to estimate my regression, especially I conduct "POOL" regression analysis[5] since my data sample is small (number of country is 5 and my number of period is 18). The regression equation is as the following:

$$LN(\boldsymbol{FDI})_{it} = \beta_0 + \beta_1 LN(\boldsymbol{MS})_{it} + \beta_2 \boldsymbol{RLC}_{it} + \beta_3 LN(\boldsymbol{GROWTH})_{it} + \beta_4 LN(\boldsymbol{TRADE})_{it} + \beta_5 LN(\boldsymbol{POP})_{it} + \varepsilon_{it}$$

I am taking log on FDI, MS, GROWTH, TRADE and POP because I want to smooth my data to get better estimation coefficients. I do not use the log expression for the RLC because it contains some negative numbers. I use the percentage expression to stand for RLC. I take logs of the independent variables since the range will be narrower so we could get better regression results.

Based on previous literature, table 4 gives expected signs and reasons.

[5] I use the software SHAZAM.

Table 4: Expected Signs for Basic Coefficients

Determinants	Expected Signs	Reason
Market size	+	Based on previous studies, the larger the market size of a country, the more FDI is likely to be received in that country.
Relative Labor Cost	−	The lower the labor cost, the more FDI inflows.
Growth Rate	+	The higher the growth rate, the more FDI inflows since foreign investors anticipate larger returns.
Trade	+	The more open is the economy, the more FDI inflows since foreign investors can invest for vertical FDI purposes.
Population	?	? ?

4.2 Analysis of FDI determinants

Now I verify potential problems of my model such as an endogeneity between the independent variable and the error terms or heteroskedasticity. The result of diagnostic test is show on Table 5.

Table 5: Diagnostic test for equation estimated using OLS

Test statistic	Value	P-value
Durbin-Wu-Hausman test	2.156	0.788
LM-Test	18.432	0.005
Ramsey test	1.901	0.102

First, I verify for any endogeneity problem. By adding the lag variable for GDP, Growth, Trade, Population and Relative Labor Cost into the regression. I use the Durbin-Wu-Hausman Test[6], the null hypothesis being that there is no endogeneity problem in my model. Since the p-value for my test is 0.788, which is greater than 5% so I do not rejected the null hypothesis. Thus, I can conclude that there is no endogenous problem in my model.

I also verify the heteroskedasticity by using the LM-Test[7]. Based on the output, I got a p-value for the null hypothesis of no heteroskedasticity equals to 0.005, which means I do reject the null hypothesis. So there is heteroskedasticity problem in my model. In the presence of heteroskedasticity, the OLS[8] estimator is inefficient and the usual t and F test are not valid. So I adjust it by using GLS[9] estimator to construct t, F, or Wald test statistics. But one problem with the GSL estimator is how to measure goodness of fit once the estimates have been obtained. Sometimes R-SQUARE for the transformed model may not be meaningful because it does not lie between 0 and 1. In my case, the R-SQUARE is 0.6666 which is not bad in the pool estimation part.

In addition, I also run the Ramsey test[10] to see if there are enough independent variables in my regression. Since the null hypothesis is that there are enough variables in my regression and the p-value for the null hypothesis is 0.102 which is greater than

[6] Durbin–Wu–Hausman test is a test for endogeneity. Davidson and MacKinnon (1993) suggest an augmented regression test (DWH test), which can easily be formed by including the residuals of each endogenous right-hand side variable, as a function of all exogenous variables, in a regression of the original model.

[7] LM-Test is the Lagrange Multiplier test. It is a test for heteroskedasticity.

[8] Original Least Squares (OLS) is a basic method of estimation in econometrics.

[9] Generalized Least Squares (GLS) is a method of estimation that can create the heteroskedasticity.

[10] Ramsey Test for Heteroscedasticity and Omitted Variables.

5%, I do not reject the null hypothesis. So I can conclude there are sufficient variables in my model.

4.2 .1 Panel Data Methods

Table 6 reports the results of the "POOL" analysis. The main results are consistent with the previous literature.

Table 6 Regression Results for POOL analysis

Dependent Variable: FDI inflows

Independent Variables	Coefficients	P-Value
In(MS)	**1.20400**	**0.000**
Relative Labor Cost	**-3.66630**	**0.000**
In(GROWTH)	**1.72030**	**0.000**
In(Trade)	**1.61380**	**0.000**
In(POP)	**-0.17206**	**0.182**
Constant	**-3.53270**	**0.459**

The coefficient for the variable (Market Size) is 1.20 (positive), which means when the market size increase by 1%, FDI increases by 1.2%. The p-value is 0.000, which is less than 1% so I can conclude the market size is statistically significant at

the 1% level. The growing size of the market is likely to have a positive influence on the amount of investment made by foreign firms. But there seems to be a cointegration problem[11] since FDI and GDP are nonstationary variables and they both grow as a pair. Despite this, these results prove that the amount of FDI inflow is positively related to the host region's market size. This result suggests that China should be in a position to attract FDI.

The coefficient of the relative labor cost is -3.67 (negative) which means when the labor cost increase by 1%, FDI decreases by 3.67%. The p-value is 0.000, which is less than 1% so I can conclude the variable of relative labor cost is also significant at 1% significance level. The result suggests that labor cost is potentially the most important determinant of FDI. The country with higher labor cost will be less attractive for the foreign investors since they have to pay more to get into the country's business. Low labor cost countries attract more FDI than high labor cost ones.

The coefficient of the growth rate is 1.72 (positive), which means that when the growth rate increases by 1%, FDI increases by 1.72%. The p-value is 0.000, which is less than 1%. So I can conclude the growth rate is significant at 1% level. The intuition is straightforward, since the rapid growth rate of a country means a better investment environment and larger expected profits.

The estimation coefficient of trade intensity is 1.61 (positive), which means when the trade intensity increase by 1%, FDI increases by 1.61%. The p-value is

[11] Cointegration refers to a linear combination of nonstationary variables.

0.000, which is less than 1%. So from the result the trade intensity is significant at 1% level.

The estimation coefficient of population is -0.17 (negative). The p-value is 0.182, which is greater than 1% so I do not reject the null hypothesis. The variable of population is not significant at 1% level. In this case, population is rejected by sample regression.

4.2 .2 Individual Countries Data Methods

Secondly, I try to conduct individual tests for each country. The main results are not consistent with the previous literature. The p-values are too large, so it is hard to reject the null hypothesis that a particular coefficient is zero in the individual country regressions. These results are shown in the appendix 3. Pooling of time-series and cross-section data is often recommended when sample size is small. In my case, the fairly short time series for each country means that the degrees of freedom are much lower. In addition, the data suggest multicollinearity problems for the individual countries.

4.3 Limitations

The first limitation of this study is the small sample of the data. In this paper, I just obtain 18 years' data and five cross countries. By obtaining more time series and cross country identities, the result may become more accurate.

The second limitation is the cointegration problem. As I mentioned in the methodology part, there is a cointegration problem associated with the regression. FDI inflows could have positive effect on host country's GDP. But at the same time, a country with a high GDP could possibly attract more FDI because of the more attractive investment environment. Therefore, there should be several adjustments on the regression. Since we are suspecting that it may have the cointegration problem so we can test it by using two methods:

1. The Engle-Granger methodology seeks to determine whether the residuals of the equilibrium relationship are stationary. $\beta' x_t = e_t$. Is e_t stationary?
2. The Johansen (1988) and Stock-Watson methodologies determine the rank of π. There are as many cointegrating vectors as the rank of π.

By performing the unit root test I found that both FDI and GDP are non-stationary variables. Engle-Granger (1987) pointed out that a linear combination of two or more non-stationary series maybe stationary. If such a stationary linear combination exists, the non-stationary series are said to be cointegrated. Therefore, I performed the cointegration test and since the MacKinnon-Haug-Michelis (1999) p-values is 0.04 which means we do have the trend specification of FDI and GDP. In this case, as FDI and GDP have the same trend, we can still use the level regression to perform the pool test as I reported above.

Since the cointegration problem does exist, we can solve it by using the FDI/GDP ratio as the dependent variable. Thus more variables will be used and can be done in further study.

5. CONCLUSION

This paper has attempted to assess the determinants of FDI in Asian countries and its effects on the whole economy. After presenting a review of previous work done on the determinants of FDI, the background of these Asian countries and the spillover effects of FDI on host countries, an empirical study using panel data methodology is done to determine the factors that could have influenced FDI from year 1987 to 2004.

From the regression results above, market size, the growth rate and trade intensity contribute positively to the FDI inflows, which is consistent with many previous studies. For the relative labor cost we can see that it is negatively significant, which is also consistent with previous studies? For the population size, it is rejected by the sample regression. So we can conclude that FDI in our Asian five countries does not seem to be affected by the size of the population.

If Asian countries want to close the gap with the rest of the world, one way will be attracting more FDI since FDI has positively impact on the economic growth as I presented it in the literature review part. If countries wish to attract and channel FDI, they must design and implement the policies that produce that effect.

The findings, to some extent, carry some implications for policy in the developing countries especially for Asian countries. Because of the influence of the market size, relative labor cost, growth rate, and the trade intensity on FDI inflows, it is meaningful for the developing countries to consider the above aspects to design of

FDI policy.

In this regard, there are no easy solutions, since the positive results of some Asian countries, such as Singapore, is the product of decades of active and focused FDI policies couched in explicit national development strategies. So there is a long way for the developing countries to go.

Finally I provide some interesting issues that deserve further study. One possible extension of this paper is to add data so that I can handle better the cointegration problem in the panel regression. It would be interesting as well with more data to investigate the determinants of FDI on individual countries.

REFERENCES

Agarwal, J.P. (1980) "Determinants of Foreign Direct Investment: A Survey", *Welwirtschaftliches Archiv*, 116: 739-773

Arestis, P., and Mariscal, I. (1997) "Conflict, Effort and Capital Stock in UK Wage Determination", *Empirica*, 24(3): 179-193

Bagchi-Sen, S., Wheeler, J.O. (1989) "A spatial and temporal model of foreign direct investment in the United States", *Economic Geography,* 65(2): 113–129.

Balasubramanyam, V.N. and Mahambare, V. (2003) "Foreign Direct Investment in India", Lancaster University Management School working paper, http://www.lums.co.uk/publications

Balasubramanyam, V.N., Salisu, M. and Sapsford, D. (1996) "Foreign Direct Investment and growth: new hypothesis and evidence", Lancaster University. Discussion Paper C7/96

Balasubramanyam, V.N., Salisu, M. and Sapsford, D. (1999) "Foreign Direct Investment as an Engine of Growth", *Journal of International Trade and Economic Development*, 8: 27-40

Bandera, V.N., and White, J.T. (1968) "US Direct Investments and Domestic Markets in Europe", *Economia Internazionale* (February): 117-133

Bende- Nabende, A. (1999) "FDI & economic growth in host developing countries", *Business and Economics*, 25: 116

Borensztein, E. (1998) "How does Foreign Direct Investment Affect Economic Growth?" *Journal of International Economics,* 45: 115-35

Broadman, H.G., and Sun, X. (1997) "The Distribution of Foreign Direct Investment in China", *The World Economy*, 20(3): 339-362

Carkovic, M., and Levine, R. (2002) "Does Foreign Direct Investment Accelerate Economic Growth", University of Minnesota Department of Finance Working Paper

Caves, R. (1974) "Multinational firms, competition, and productivity in host country market", Economica, 41: 76-193

Chakraborty, C., and Basu, P. (2002) "Foreign direct investment and growth in India:

a cointegration approach", *Applied Economics*, 34(9): 1061 - 1073

Chen, C., Chang, L. (1995) "The Role of Foreign Direct Investment in China's Post 1978 Economic Development", *World Development*, 123: 691-703

Cheng, L.K., Kwan, Y.K., (1999) "Foreign capital stock and its determinants. In: Yanrui Wu (Ed.), Foreign Direct Investment and Economic Growth in China", *Journal of International Economics*, 21: 174-184

Chudnovsky, D., and López1, A. (1999) "Globalization and Developing Countries: Foreign Direct Investment and Growth and Sustainable Human Development", Paper prepared for the UNCTAD/UNDP Global Programme on "Globalization, Liberalization and Sustainable Development"

Coughlin, C.C., Terza, J.V., Arromdee, V. (1991) "State characteristics and the location of foreign direct investment within the United States", *Review of Economics and Statistics,* 73(4): 675–683

Coughlin, C., and Segev, E. (2000) "Foreign Direct Investment in China: A SpatialEconometric Study", *The World Economy*, 23(1): 1-23

Culem, C. (1988) "The Locational Determinants of Direct Investment among Industrial Countries", *European Economic Review,* 32: 885-904

Davidson, R., and MacKinnon, J.G. (1993) "Estimation and Inference in Econometrics by Economica", *New Series,* 62(February): 133-134

Davis, S.W., and Lyons, B.R. (1991), "Characterising Relative Performance: The Productivity Advantage of Foreign Owned Firms in the UK", *Oxford Economic Papers*, 43: 584-595

De Mello, L. R. (1997) "FDI in Developing Countries and Growth: A selective survey", *The Journal of Development Studies*, 34(1): 1-34

Dollar, D. (1992) "Outward-Oriented Developing Economies Really Do grow More Rapidly: Evidence from 95 LDCs, 1976-85", *Economic Development and Cultural Change*, 523-544

Douglas, P.W., Robert, J.R. (1993) "The location of export-oriented foreign direct investment in the Caribbean Basin", *Journal of International Business Studies,* 24: 15-17

Dunning, J.H. (1981) "Toward an Eclectic Theory of International Production: some

empirical tests", *The Journal of International Business Studies*, 12: 31-35
Edwards, S. (1998) "Openness, Productivity and Growth: What Do We Really Know", *Economy Journal*, 108: 383-398

Friedman, J., Gerlowski, D.A., Silberman, J. (1996) "Foreign direct investment: the factors affecting the location of foreign branch plants in the United States", *Global Finance Journal,* 7 (2): 209–222.

Haaland, J.I., and Wooton, I. (2003), "Domestic Labour Markets and Foreign Direct Investment", *CEPR Working Paper*, 3989, July, CEPR, London

Henley, J., Kirkpatrick, C., and Wilde, G. (1999) "Foreign Direct Investment in China: Recent Trends and Current Policy Issues", *The World Economy,* 22(2): 223-243

Huang, Y.S. (1998) "FDI in China: An Asian Perspective. Singapore: The Institute of Southeast Asian Studies", The World Economy, 21(2): 169-178

Imad, A.M. (2002) "Foreign direct investment, Theory, Evidence and Practice", working paper, page 1.

International Monetary Fund (1993) *Balance of Payments Manual,* fifth edition *(BPM5)* (Washington).

Jaumotte, F. (2004) "Foreign Direct Investment and Regional Trade Agreements: Market Size Effect Revisited", IMF Working Papers 04/206, International Monetary Fund.

Johansen, S. (1988) "Statistical analysis of cointegration vectors", *Journal of Economic Dynamics and Control,* 12(2): 231-254

Kidron, M. (1965) "Foreign Investments in India", London, Oxford University Press

Kravis, I.B., and Lipsey, R.E. (1982) "Location of overseas production and production for exports by US multinational firms", *Journal of International Economics*, 12: 201-233

Kucera, D. (2002) "Core Labour Standards and Foreign Direct Investment", *International Labour Review*, forthcoming in 2002

Kumar, N. (1994) "Multinational Enterprises and Industrial Organization: The Case of India", New Delhi: Sage

Lardy, N. (1992) "The Role of Foreign Trade and Investment in China's Economic Transformation" *China Quarterly*, 144: 1065-1082

Lee, C.H., and Ramstetter, E.D. (1991) "Direct Investment and Structural Change in Korean Manufacturing", *Asian Economic Journal*, 6(2): 93-113

Leichenko, R.M., and Erickson, R.A. (1997) "Foreign Direct Investment and State Export Performance", *Journal of Regional Science*, 37(2): 307–329

Liu, X., Song, H., Wei, Y., and Romilly, P. (1997) "Country Characteristics of Foreign Direct Investment in China: a Panel Data Analysis", *Weltwirtschaftliches Archiv,* 133(2): 313-329

Lunn, J. (1980) "Determinants of U.S. Direct Investment in the EEC: Further Evidence", *European Economic Review,* 13(1): 93-101

MacKinnon, J.G., Haug, A.A., and Michelis, L. (1999) "Numerical distribution functions of likelihood ratio tests for cointegration", *Journal of Applied Econometrics*, 14: 563-577

Mansur, Y. (2001) "What attracts Foreign Direct Investment (FDI)", *Jordan Times* (Monday, November 26, 2001)

McLeman (1994) "Malaysian Economics Policy and FDI", http://www.essaydepot.com/essayme/295/index.php

Milner, C., and Pentecost, E. (1996) "Locational Advantage and US Foreign Direct Investment in UK", *Applied Economics*, 28: 605-615

Nair-Reichert, U., and Weinhold, D. (2001) "Causality Tests for Cross-Country Panels: a New Look at FDI and Economic Growth in Developing Countries", *Oxford Bulletin of Economics and Statistics,* 63(2): 153–171

Nigh (1985) "The Effects of Political on U.S Direct Foreign Investment: A Pooled Time-Series Cross-Sectional Analysis" *Journal of International Business Studies*

Olsson, J. (1994) "Malaysian Economic Policy and FDI", http://www.geocities.com/TimesSquare/1848/malay.html

Perkins, D.H., Radelet, S., and Lindauer, D.L. (2001) Economics of Development, Chapter 3: 182

Physica-Verlag, H.D. (2006) "The Determinants of FDI - What Can the Transition Countries Do to Attract FDI?" The Impact of FDI on Economic Growth, *Contributions to Economics*: 141-151

Schneider, F., and Frey, B.S. (1985) "Economic and Political Determinants of Foreign Direct Investment", *World Development*, 13(2): 161-175

Shamsuddin, Z.H. (1994) "Microbial inoculants for increased crop production", *Research UPM.*

Singh, H., and Jun, K.W. (1995) "Some New Evidence on Determinants of Foreign Direct Investment in Developing Countries", World Bank Policy Research Working Paper No. 1531, Available at SSRN: http://ssrn.com/abstract=623885

Sun, H.S. (1998) "Macroeconomic Impact of Direct Foreign Investment in China: 1979-96", *The World Economy,* 21(5): 675-694

Sun, Q., Tong, W., and Yu, Q. (2002) "Determinants of foreign direct investment across China", *Journal of International Money and Finance*, 21(1): 79-113

Tsai, P. (1994) "Determinants of FDI and its Impact on Economic Growth" *Journal of Economic Development,* 19: 137-161

UNCTAD (1999) "Foreign Direct Investment and the Challenge of Development", *World Investment Report*, New York: United Nations

UNCTAD (2001) "Foreign Direct Investment in Least Development Countries", *World Investment Report.* Geneva

Venkataramany (1999) "Determinants of Foreign Direct Investment in India: An Empirical Analysis of Source Countries and Target Industries" Ashland University, USA

Wang, Z. Q., and Swain, N.J. (1995) "The Determinants of Foreign Direct Investment in Transforming Economies PP. Empirical Evidence from Hungary and China", *Weltwirtschaftsliches Archiv*, 131(2): 359-382

WDI (2006) Word Development Index. Washington, D.C.: The Word Bank

Wei, S.J. (1996) "Attracting Foreign Direct Investment: Has China Reached its Potential", *China Economic Review,* 6(2): 187-199

Wei, Y.Q., Liu, X.M., Parker, D., Vaidya, K. (1999) "The Regional Distribution of Foreign Direct Investment in China", *Regional Studies,* 33: 857-867

Wheeler, D., and Mody, A. (1992) "International Investment Location Decisions: The Case of US Firms", *Journal of International Economics*, 33: 57-76

Yogarajah, A. (2001) "Liberalization and its Impact on Foreign Direct Investment in India", Ph.D. Thesis, Nanyang Business School, Nanyang Technological University,

Singapore.

Zhang, K. H. (2001) "Does Foreign Direct Investment Promote Economic Growth? Evidence From East Asia and Latin America", *Contemporary Economic Policy*, 19(2): 175–185

Zhong, W.K. (2005) "Market size is key to absorb FDI", http://findarticles.com/p/articles/mi_hb048/is_200504/ai_n15317853

APPENDIX 1

Residual PPP Calculation

obs	China RESID_CHN	India RESID_IND	Korea RESID_KOR	Singapore RESID_SGP	Malaysia RESID_MYS
1987	-0.15159	-0.12124	0.048104	0.23364	0.074425
1988	-0.1297	-0.13264	0.137687	0.287224	0.05144
1989	-0.11935	-0.16757	0.205356	0.318715	0.028867
1990	-0.18524	-0.17367	0.19872	0.380641	0.030285
1991	-0.20752	-0.21717	0.205635	0.4144	0.00824
1992	-0.20782	-0.2342	0.184992	0.481587	0.040945
1993	-0.19583	-0.25499	0.180888	0.440077	0.038639
1994	-0.25767	-0.24835	0.206889	0.515307	0.028454
1995	-0.23693	-0.24365	0.267861	0.599075	0.055753
1996	-0.23134	-0.25373	0.241145	0.553343	0.052141
1997	-0.23698	-0.25057	0.110554	0.500076	-0.01704
1998	-0.25125	-0.26548	-0.11037	0.316075	-0.13358
1999	-0.26376	-0.27191	-0.03952	0.217015	-0.14272
2000	-0.2728	-0.27915	-0.03225	0.1531	-0.15243
2001	-0.2835	-0.28735	-0.12038	0.098395	-0.17088
2002	-0.294	-0.29117	-0.11169	0.041828	-0.16294
2003	-0.30152	-0.28517	-0.08691	0.03927	-0.15639
2004	-0.30115	-0.27816	-0.07499	0.034804	-0.13029

APPENDIX 2

Data set for China

YEAR	GDP	FDI	POP	RLC	TRADE	GROWTH
1987	2.68E+11	2.31E+09	1.08E+09	-0.1515909	0.3081566	11.499999
1988	3.07E+11	3.19E+09	1.10E+09	-0.1296989	0.3346197	11.999999
1989	3.42E+11	3.39E+09	1.12E+09	-0.1193539	0.3262716	12.079999
1990	3.55E+11	3.49E+09	1.14E+09	-0.1852363	0.3254979	9.8599996
1991	3.77E+11	4.37E+09	1.15E+09	-0.2075151	0.3603159	7.9200012
1992	4.18E+11	1.12E+10	1.16E+09	-0.2078168	0.3958218	8
1993	4.41E+11	2.75E+10	1.18E+09	-0.1958298	0.4442725	8.520002
1994	5.59E+11	3.38E+10	1.19E+09	-0.2576719	0.4231224	9.060002
1995	7.28E+11	3.58E+10	1.20E+09	-0.2369275	0.3857965	10.860001
1996	8.56E+11	4.02E+10	1.22E+09	-0.2313352	0.3386106	12.280002
1997	9.53E+11	4.42E+10	1.23E+09	-0.2369846	0.3413227	12.440002
1998	1.02E+12	4.38E+10	1.24E+09	-0.2512475	0.3177657	11.46
1999	1.08E+12	3.88E+10	1.25E+09	-0.2637551	0.3329061	10.22
2000	1.20E+12	3.84E+10	1.26E+09	-0.2728022	0.3957505	9.119999
2001	1.32E+12	4.42E+10	1.27E+09	-0.2835001	0.3846983	8.6200008
2002	1.45E+12	4.93E+10	1.28E+09	-0.2939997	0.4269874	8.2799996
2003	1.64E+12	5.35E+10	1.29E+09	-0.3015235	0.518592	8.2400002
2004	1.93E+12	5.49E+10	1.30E+09	-0.3011451	0.5976841	8.6800002

Data set for India

YEAR	GDP	FDI	POP	RLC	TRADE	GROWTH
1987	2.73E+11	2.12E+08	7.99E+08	-0.121237	0.1023563	5.0649384
1988	2.91E+11	9.13E+07	8.16E+08	-0.1326442	0.1115549	5.1874956
1989	2.92E+11	2.52E+08	8.33E+08	-0.1675733	0.1245867	5.7437756
1990	3.17E+11	2.37E+08	8.50E+08	-0.1736718	0.1310953	6.2074366
1991	2.67E+11	7.40E+07	8.67E+08	-0.2171718	0.1430499	6.2432764
1992	2.44E+11	2.77E+08	8.83E+08	-0.2342007	0.176951	5.457265
1993	2.74E+11	5.50E+08	8.99E+08	-0.2549945	0.1619345	5.6578264
1994	3.23E+11	9.73E+08	9.16E+08	-0.2483528	0.1607955	4.6599536
1995	3.55E+11	2.14E+09	9.32E+08	-0.2436476	0.1839636	4.864195
1996	3.85E+11	2.43E+09	9.49E+08	-0.253734	0.1843405	5.2315892
1997	4.10E+11	3.58E+09	9.65E+08	-0.2505652	0.1865872	6.5291734
1998	4.14E+11	2.64E+09	9.82E+08	-0.2654845	0.1846604	6.3704834
1999	4.52E+11	2.17E+09	9.99E+08	-0.2719105	0.1828287	6.593919
2000	4.61E+11	3.58E+09	1.02E+09	-0.2791509	0.203539	6.5269376
2001	4.78E+11	5.47E+09	1.03E+09	-0.2873456	0.1960118	5.7957388
2002	5.06E+11	5.63E+09	1.05E+09	-0.2911709	0.2089951	5.3724636
2003	6.01E+11	4.59E+09	1.06E+09	-0.2851664	0.2136374	5.2027668
2004	6.95E+11	5.34E+09	1.08E+09	-0.278161	0.2488677	5.6612456

Data set for Korea

YEAR	GDP	FDI	POP	RLC	TRADE	GROWTH
1987	1.40E+11	6.16E+08	4.16E+07	0.04810361	0.6306895	8.724714
1988	1.87E+11	1.01E+09	4.20E+07	0.13768684	0.6002065	9.4806094
1989	2.30E+11	1.12E+09	4.24E+07	0.20535634	0.5373363	9.4538434
1990	2.64E+11	7.89E+08	4.29E+07	0.19871994	0.5112681	9.1821912
1991	3.08E+11	1.18E+09	4.33E+07	0.2056346	0.4977383	9.652851
1992	3.30E+11	7.28E+08	4.37E+07	0.18499225	0.4801875	9.4076482
1993	3.62E+11	5.88E+08	4.41E+07	0.18088757	0.458491	8.3619344
1994	4.23E+11	8.09E+08	4.45E+07	0.20688928	0.4684575	7.4604166
1995	5.17E+11	1.78E+09	4.51E+07	0.2678615	0.5031289	7.818891
1996	5.58E+11	2.33E+09	4.55E+07	0.24114518	0.5022092	7.821605
1997	5.16E+11	2.84E+09	4.60E+07	0.1105545	0.5438494	7.3427062
1998	3.45E+11	5.41E+09	4.63E+07	-0.1103687	0.65308	7.0977552
1999	4.45E+11	9.33E+09	4.66E+07	-0.0395169	0.5914651	4.5001428
2000	5.12E+11	9.28E+09	4.70E+07	-0.0322482	0.6503322	4.6900708
2001	4.82E+11	3.53E+09	4.74E+07	-0.1203833	0.604982	4.5535128
2002	5.47E+11	2.39E+09	4.76E+07	-0.1116947	0.5752006	3.9211278
2003	6.08E+11	3.53E+09	4.78E+07	-0.0869074	0.6127524	4.3850056
2004	6.80E+11	8.19E+09	4.81E+07	-0.0749943	0.703731	6.3753246

Data set for Singapore

YEAR	GDP	FDI	POP	RLC	TRADE	GROWTH
1987	2.05E+10	2.84E+09	2775000	0.233639696	2.981096	4.929024
1988	2.53E+10	3.65E+09	2846000	0.287224485	3.283312	5.4674564
1989	3.01E+10	2.89E+09	2931000	0.318715357	3.132288	6.0571082
1990	3.69E+10	5.57E+09	3047000	0.380641222	3.075873	6.3957044
1991	4.32E+10	4.89E+09	3136000	0.414400193	2.895558	8.5229962
1992	4.99E+10	2.20E+09	3232000	0.481586757	2.720319	9.4120236
1993	5.84E+10	4.69E+09	3315000	0.44007657	2.728933	8.7154358
1994	7.06E+10	8.55E+09	3421000	0.515306592	2.82531	8.7691898
1995	8.39E+10	1.16E+10	3526000	0.599074969	2.892489	9.0774658
1996	9.22E+10	9.50E+09	3670000	0.553342922	2.77975	8.8678108
1997	9.54E+10	1.35E+10	3794000	0.500076338	2.698499	9.1125686
1998	8.19E+10	7.41E+09	3923000	0.316074818	2.583632	9.5101694
1999	8.14E+10	1.66E+10	3952000	0.217015086	2.773881	6.882585
2000	9.15E+10	1.65E+10	4017700	0.153099804	2.977269	6.0053094
2001	8.49E+10	1.41E+10	4131200	0.098395449	2.801313	6.3817636
2002	8.83E+10	5.72E+09	4171300	0.041828223	2.737101	4.3699248
2003	9.24E+10	9.35E+09	4185200	0.039270187	3.205832	3.5130658
2004	1.07E+11	1.60E+10	4240300	0.034803924	3.462722	4.3809162

Data set for Malaysia

YEAR	GDP	FDI	POP	RLC	TRADE	GROWTH
1987	3.22E+10	4.23E+08	1.65E+07	0.07442498	0.952094	3.9966726
1988	3.53E+10	7.19E+08	1.69E+07	0.05144006	1.067734	3.8862162
1989	3.88E+10	1.67E+09	1.74E+07	0.02886674	1.223958	4.6237108
1990	4.40E+10	2.33E+09	1.78E+07	0.03028458	1.333585	4.883022
1991	4.91E+10	4.00E+09	1.83E+07	0.00824045	1.444971	6.9094016
1992	5.92E+10	5.18E+09	1.88E+07	0.04094505	1.363064	8.5879928
1993	6.69E+10	5.01E+09	1.93E+07	0.03863936	1.386976	9.287287
1994	7.45E+10	4.34E+09	1.98E+07	0.02845426	1.590262	9.2787316
1995	8.88E+10	4.18E+09	2.04E+07	0.0557531	1.70664	9.309444
1996	1.01E+11	5.08E+09	2.09E+07	0.05214089	1.554211	9.4733306
1997	1.00E+11	5.14E+09	2.14E+07	-0.017044	1.575041	9.5647776
1998	7.22E+10	2.16E+09	2.20E+07	-0.1335824	1.823671	9.252303
1999	7.91E+10	3.90E+09	2.25E+07	-0.142721	1.887858	5.8014304
2000	9.03E+10	3.79E+09	2.30E+07	-0.1524303	1.995046	5.1865438
2001	8.80E+10	5.54E+08	2.35E+07	-0.1708811	1.839421	4.992501
2002	9.53E+10	3.20E+09	2.40E+07	-0.1629449	1.825692	3.0556017
2003	1.04E+11	2.47E+09	2.44E+07	-0.1563909	1.80858	2.4616805
2004	1.18E+11	4.62E+09	2.49E+07	-0.1302909	1.959074	5.0166679

APPENDIX 3

The output for Individual Countries Data Methods

China

VARIABLE NAME	ESTIMATED COEFFICIENT	STANDARD ERROR	T-RATIO 12 DF	P-VALUE	STANDARDIZE COEEFICIENT	ELASTICITY AT MEANS
LNGDP	-3.296	0.912	-3.612	0.004	-1.787	-3.800
LNPOP	44.617	10.39	4.292	0.001	2.142	39.411
LNGROWTH	4.016	0.990	4.057	0.002	0.562	0.387
RLC	-12.905	5.499	-2.347	0.037	-0.617	0.125
LNTRADE	1.749	0.773	2.261	0.043	0.264	-0.071
CONSTANT	-829.64	196.3	-4.225	0.001	0.000	-35.052

India

VARIABLE NAME	ESTIMATED COEFFICIENT	STANDARD ERROR	T-RATIO 12 DF	P-VALUE	STANDARDIZE COEEFICIENT	ELASTICITY AT MEANS
LNGDP	1.713	3.786	0.452	0.659	0.343	2.196
LNPOP	6.727	22.80	0.295	0.773	0.425	6.683
LNGROWTH	-1.338	1.525	-0.877	0.397	-0.096	-0.112
RLC	-8.023	22.42	-0.357	0.727	-0.285	0.091
LNTRADE	-0.381	2.660	-0.143	0.888	-0.061	0.033
CONSTANT	-164.10	370.0	-0.444	0.665	0.000	-7.891

Korea

VARIABLE NAME	ESTIMATED COEFFICIENT	STANDARD ERROR	T-RATIO 12 DF	P-VALUE	STANDARDIZE COEEFICIENT	ELASTICITY AT MEANS
LNGDP	-5.125	2.165	-2.376	0.036	-2.339	-6.380
LNPOP	76.139	25.96	2.933	0.013	3.809	62.631
LNGROWTH	-0.474	0.647	-0.734	0.477	-0.157	-0.046
RLC	12.547	4.074	3.080	0.010	1.879	0.046
LNTRADE	5.142	1.277	4.026	0.002	0.696	-0.140
CONSTANT	-1180.8	400.7	-2.946	0.012	0.000	-55.114

Singapore

VARIABLE NAME	ESTIMATED COEFFICIENT	STANDARD ERROR	T-RATIO 12 DF	P-VALUE	STANDARDIZE COEEFICIENT	ELASTICITY AT MEANS
LNGDP	-1.386	2.246	-0.617	0.549	-1.081	-1.518
LNPOP	10.319	9.336	1.105	0.291	2.260	6.854
LNGROWTH	0.741	0.842	0.880	0.396	0.352	0.062
RLC	2.174	3.082	0.705	0.494	-0.618	0.030
LNTRADE	4.731	2.375	1.992	0.070	0.562	0.223
CONSTANT	-105.61	87.72	-1.204	0.252	0.000	-4.654

Malaysia

VARIABLE NAME	ESTIMATED COEFFICIENT	STANDARD ERROR	T-RATIO 12 DF	P-VALUE	STANDARDIZE COEEFICIENT	ELASTICITY AT MEANS
LNGDP	3.448	3.636	0.948	0.362	1.749	3.967
LNPOP	-14.523	15.99	-0.908	0.382	-2.415	-11.271
LNGROWTH	-0.196	0.562	-0.349	0.733	-0.106	-0.016
RLC	-1.135	10.83	-0.105	0.918	-0.136	0.002
LNTRADE	4.077	2.371	1.719	0.111	1.085	0.082
CONSTANT	178.68	181.8	0.983	0.345	0.000	8.237