

## LINKAGES BETWEEN FOREIGN DIRECT INVESTMENT AND ITS DETERMINANTS IN MALAYSIA

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### Abstract

*This paper addresses the relationship between Foreign Direct Investment (FDI) and its determinants in Malaysia. The annual data for the period of 1970 to 1999 were employed in this study. The OLS regression is used to determine the relationship between FDI and its independent variables. The variables are estimated in the full model (Model I) and different sub-models (Model II, Model III and Model IV). Generally, the results indicate that there are at least four factors that may be used to predict the level of FDI in Malaysia. These variables are inflation rate, gross domestic product (GDP), import, and export are among the main determinants of FDI in Malaysia.*

**Keywords:** *foreign direct investment, inflation rate, GDP, import, and export*

### INTRODUCTION

The definition of Foreign Direct Investment (henceforth, FDI), which is derived from The Departments of Statistics<sup>1</sup> of Malaysia as “foreign-controlled” companies, in which fifty percent or more of the equity share capital is held by non residents. The FDI inflows are then defined to comprise branches’ liabilities to Head Office and other foreign liabilities plus subsidiaries’ share capital, undistributed profits as well as other liabilities to the parent companies.

In Malaysia, the transition from import substitution to export orientation initially started in the early 1957. There are three factors that led to export-oriented industries, as derived by Ariff (1985). Firstly, a poor record of import substitution, which earlier policies failed to generate sustained manufacturing output and employment

growth. Second, the success of the “Four Asian Tigers” or Newly Industrialized Economies (NIEs)<sup>2</sup> in achieving rapid growth and improving the distribution of income through export-led-industrialization. Third, Foreign Direct Investment (FDI), which has a remarkable growth of export, especially in the manufacturing sector which had become a very important impetus from structural transformation of the Malaysia industry.

The Malaysian New Economic Policy was introduced in 1971. It brought forth a new policy to alter the economic and sectoral structures as well as to eradicate poverty. Industrial development was accelerated in order to achieve both a high economic growth rate plus an ethnic-distribution objective. Malaysia welcomed FDI inflows after 1970, but it was not so

<sup>1</sup> Quarterly Balance of Payments Report 2000, Department of Statistics, Malaysia

<sup>2</sup> NIEs represented by Hong Kong, South Korea, Taiwan and Singapore

strong in doing so. However, due to a global recession in 1980, high interest rate led to costly holding of inventories plus a drastic reduction in domestic demand. The government then increased in public expenditure, which was then accompanied by a high public sector debt. Hence, the urgent need for non-debt creation in addition to increased job opportunities and export promotion attracted more FDI to the country (Phang, 1998).

The Industrial Master Plan (IMP)<sup>3</sup> 1986-1995 was introduced to provide direction for industrialization and export manufacturing. Foreign Direct Investment (FDI) benefited significantly from this program since the government was keen to attract foreign Multinational Companies (MNCs) that provide capital, technology and foreign market access. The share of FDI in manufacturing exports increased continuously. To encourage exports, Malaysia passed the Promotion of Investment Act 1986 which contains major tax incentives for exports including the provision of abatement by using local material for manufactured products for export (Ismail, 1990).

However, attracting FDI is going to be more difficult now as compared to before. Foreign investors have more options now as more and more countries open up their economies to foreign equity participation. Liberalization in China and India, in particular, is likely to cause FDI to bypass Southeast Asia. Now, Korea is also actively seeking foreign equity after facing trauma in financial crisis. A large portion FDI was diverted into China after Chinese Yen was devalued in 1994 (Chen, 1997).

The general purpose of this study is to identify the determinants of foreign direct

investment in Malaysia. The specific purposes are as follows:

- a. To investigate the relationship between FDI and its determinants.
- b. To derive some policy alternatives related to FDI in manufacturing sector.

The major bulk of FDI flows to China, which is now the largest recipient in developing countries and the second largest FDI recipient in the world (Chen, 1997). China has a competitive advantage in terms of cheap labor of production and availability for domestic demand. Due to the increase of the competitiveness, Malaysia has to take the opportunity to shift from labor-intensive product to capital and technology intensive. Thus, this paper would examine empirically the factors that determine the FDI flows in Malaysia, specifically in manufacturing sector.

This paper is organized as follows: section II presents the literature review on the relationship between export and growth, FDI and growth, FDI and productivity, technology spillover, and other determinants of FDI. Section III presents the methodology used in this paper, including OLS and the construction of the models. Section IV provides empirical results and discussions. Finally, summary of the main findings and policy implication as well as recommendation for further studies are presented in section V.

## LITERATURE REVIEW

Foreign Direct Investment (FDI) has become one of the most important means to integrate the economy of a country. FDI enables the investing firm to utilize their specific assets such as technologies and managerial know-how. Thus, FDI brings benefits in various aspects, which are source of funds in term of capital stock; increase in employment, income and growth, as well as in skills and technology.

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<sup>3</sup> IMP was designed to maintain robust export performance by improving Malaysia's competitiveness plus accelerating the growth and diversification of the industrial export base. It is reviewed every 5 years to provide a coherent industrial program

For developing countries, FDI has been a very important source of funding especially during the debt crisis. Numerous empirical studies have been conducted to investigate the main factor that can attract FDI to the host countries. Chen (1997) analyzed China's manufacturing industry by using the OLS cross-sectional regression and found that the inward FDI stocks of eleven industries are positively related to China's abundant labor resource endowment, market size and growth rate of industries.

Balasubramanyam et al (1999) used cross sectional annual data averaged over the period 1970 – 1985 for a sample of 46 developing countries. They found that the size of the domestic market, the companies climate in relation to local producer and interaction between FDI and human capital have an important influence upon growth performance. Their analysis indicates that FDI is more productive in countries that have pursued export promotion rather than import substitution.

Noorbakhsh and Ali (2001) examined the importance of human capital as a resource that can attract FDI into the host countries. They also tested on other variables which were equally important such as the growth rate of the labor force, the growth of domestic markets, the availability of energy, a stable macroeconomic environment are significant for FDI inflows. They concluded that the countries that rely on low-cost, low skill labor or natural resources to attract FDI will face difficulty in inducing FDI into high value-added industries and may suffer slower economic growth.

Many researchers have conducted empirical studies on the relationship between export growth and economic growth by using different method on different countries. Michaely (1977) tested on the relationship between export and economic growth

by examining the correlation between the variables, which represent the magnitude of economic performance. Tyler (1981) found a positive relationship between GDP growth and export growth, also between GDP and manufacturing export growth.

Baharumshah and Rashid (1999) narrowed down the studies to Malaysia. They conducted further empirical tests on the causal relationship between export growth and output growth. They employed the Vector Error Regression method (VER) in establishing the relationship between export and economic growth; and it was found that bi-directional relationship existed between them. Al-Marhubi (2000) presented empirical evidence in testing the link between growth and export diversification by using simple regression model. He found that the export diversification is associated with faster growth both directly and indirectly with the stimulation of the accumulation of capital.

Noland (1997) suggested that success in developing Asia's export growth was fuelled by a combination of mutually supportive events-industrialization, a reduction in trade barrier, a more integrated global environment and a growth in FDI. Meanwhile, Lensink and Morrissey (2001) studied the effect of FDI flow and volatility of FDI flows on growth. They found that FDI flows have positive effect on growth; where as volatility of FDI has a negative effect. The suggested that economies with high level of uncertain economic growth rates, appear less attractive to foreign investors.

Chamarbagwala, et. al (2000) strongly suggested that investment in human capital and technology embodied in foreign capital play a significant role in determining manufacturing productivity. Furthermore, Baldwin et al (1999) presents a theoretical growth model where MNCs directly affect the endogenous long-run growth via technological spillovers. They found that FDI leads

to knowledge spillovers, which appear to promote growth by promoting technology transfer.

According to Noorbahksh and Ali (2001), FDI has become a very important agenda which is not only a source of finance and employment but also can be a medium for acquiring skills, technology, organizational and managerial practices and access to markets. Dowling and Cheang (2000) also stressed that computers and electronics are embedded in most production processes, consumer and capital goods, which are very important to determine industrial competitiveness. In fact, they are key enabling technologies in the communications and information revolution of modern knowledge economy.

#### **METHODOLOGY**

Based on previous studies, there are many internal and external factors that determine FDI inflows into the host country. Therefore, several hypotheses can be developed regarding some potential determinants attracting FDI into Malaysia, particularly in the manufacturing sector. The determinants which would be studied in this paper are market size (gross national product), current account balance, Gross Domestic Product (GDP) in manufacturing sector, macroeconomic stability (inflation rate), export manufacturing, the level of technology, exchange rate.

The above-mentioned factors are expected to be the most important determinants of FDI. Other factors, such as resource endowment, trade barriers; political stability and investment incentives are equally important but will not be examined in this study. This is mainly because of data limitations and the difficulties in quantifying some of the variables. All the variables are expected to have positive relationship with FDI except inflation rate.

Numerous studies (see Michaely, 1977; Balassa, 1978; Tyler, 1981; Kavossi, 1984 and Islam, 1998) have done on export led growth strategy which indicate positive relationship between export and growth. Evidence also had suggested that export have proven positively associated with FDI (see Pfaffermayr, 1994; and Dowling & Cheang, 2000). Hence, it is important to include export and economic growth in the model.

For the purpose of the study, some important variables such as technology and exchange rate are used to examine whether this elements would be relevant determinant in Malaysia. Other variables include market size, current account deficit, gross domestic in manufacturing sector, domestic inflation rate and export in manufacturing sector.

The above-mentioned factors arguably are expected to be the most important determinant of FDI. However, other factors, which has been studied by many researchers such as resource endowment, political stability, trade barriers, investment incentives, legal framework also has some influence on FDI but would not be tested due to data limitations and the difficulties in quantifying some of the variables.

#### **Dependent Variable**

The dependent variable for FDI covers a period of thirty years (from 1970 to 1999). The data on net flow of FDI is only available from 1974 onwards. Since this study will focus more on FDI in manufacturing sector. Data on FDI inflow in manufacturing is used as dependent variable. However, due to lack of data on the actual volume of FDI for Malaysia, approved FDI<sup>4</sup> in manufacturing is used as proxy.

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<sup>4</sup> Bank Negara Malaysia defines as foreign equity plus foreign retained earnings / reserves plus loan attributed to foreign interest (loan attributed to foreign interest is apportioned from the total loan according to the percentage of the foreign share in the equity of each pro-

### **Independent Variable**

The variables that would be used cover both internal as well as external factors, which are expected to be the determinants of FDI in Malaysia. All independent variables, which are selected for this study are justified by following explanation:

1. Market size (GNP)

In this study, Gross National Product (GNP) at current price will be used as a proxy for market size. GNP is selected instead of Gross Domestic Product (GDP) because it is more accurate to reflect the economic performance considering the net factor income from abroad. Empirical studies examined FDI and market size found that their effects to be statistically significant (see Chen, 1997; Billington, 1999 and Noorbakhsh et al 2001). There, the market size is expected to have positive relationship with FDI.

2. Current account balance

The position of the current account transaction in balance of payments involves trade of goods, services and investment income (Batiz, second edition). However, the current account balance also can be defined as the difference of domestic saving and domestic investment (Higgins and Klitgaard, 1998). In addition, the deterioration in the current account balances also driven by an increase in domestic investment and a fall in savings (Higgins and Klitgaard, 1998), leads to less confident in foreign investors.

Considering the importance of current account balances in influencing foreign investor's decisions, this variable is considered in this study. If the result is negative, a deficit current account is said to be a factor to determine

FDI. Otherwise, if it is positive, current account surplus would be a determinant to attract FDI.

3. Gross domestic product (GDP) at current price in manufacturing sector

Theoretically, the higher portion of manufacturing output reflects the country's serious involvement in manufacturing sector that attract more foreign investors, particularly from export-oriented multinational and transnational companies. Hanson (2001) found that some multinationals are attracted to higher productivity countries and to high productivity industries within these countries. Hence, it is expected to have a positive relationship between manufacturing output and FDI.

4. Domestic inflation rate (the annual rate of inflation, as measured by CPI<sup>5</sup>)

Macroeconomic stability is a necessary precondition for financial liberalization. Successful inflation stabilization is associated with sound fiscal adjustment and an increase private sector's share of domestic credit (Noorbakhsh and Ali, 2001). Therefore, inflation rate can be used as proxy for macroeconomic stability. A viable upward swing in the inflation rate is expected to reduce FDI flows in the host country, as higher price would decrease real return in investment. Thus, obviously the relationship between the inflation rate and FDI is expected to be negative.

5. Export in manufacturing

Export has been proved by many researchers such that Tyler (1981), Pfaffermayr (1994), Islam (1998), Baharumshah et al (1999) and Al-Marhubi (2000); as a very important tool to expand economic growth. Therefore, ex-

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ject). (Monthly Statistical Bulletin, June 2003, Bank Negara Malaysia)

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<sup>5</sup> CPI are the most frequently used indicators of inflation and reflect changes in the cost of acquiring a fixed basket of goods and services by the average consumer.

port has become a very important independent variable. Considering the case of export-oriented FDI like Malaysia, in this study export in manufacturing will be used as one of the determinant of FDI and expected to have a positive sign.

6. Technology

FDI is always associated with technology transfer. However, recently, attracting FDI has become more challenging. Some MNEs tend to locate the businesses to the country, which have already better infrastructure, modern communication and modern machinery. The data for technology is very difficult to measure. Jorg (2001) used the GDP ratio of machinery import and Coe et al (1997) used import on machinery and transport equipment to measure technology.

Due to lack of data on technology, import on machinery specifically in capital good<sup>6</sup> would be used as a proxy for the level of technology. Therefore, in this study the level of technology becomes an independent variable, which is expected to have a positive relationship with FDI.

7. Exchange Rate

FDI flows are greatly influenced by a mix of micro and macroeconomic policies and other market factors. Tasneem and Zakariah (2002) mentioned that government policies towards trade, regulations, taxation, subsidy, entry rules, foreign exchange etc. are important determinants of FDI flows. In this study, exchange rates need to be tested and evaluated to see if it is related significantly in predicting the level of FDI in Malaysia.

Following on the above explanation, FDI can be modeled in the form of equation as below:

$$FDI_t = \beta_0 + \beta_1 XCHG_t + \beta_2 CPI_t + \beta_3 GDP\%_t + \beta_4 GNP_t + \beta_5 GDP_t + \beta_6 XPOT_t + \beta_7 MPOT_t + \beta_8 CA_t + \varepsilon_t \dots (1)$$

Where;

- FDI<sub>t</sub>** = foreign direct investment
- XCHG<sub>t</sub>** = exchange rate
- CPI<sub>t</sub>** = domestic in inflation rate (proxy for macroeconomic stability)
- GDP%<sub>t</sub>** = percentage of gross domestic product (in manufacturing)
- GNP<sub>t</sub>** = gross national product (proxy for market size)
- GDP<sub>t</sub>** = gross domestic product (in manufacturing)
- XPOT<sub>t</sub>** = export (in manufacturing)
- MPOT<sub>t</sub>** = import (in manufacturing – proxy for the level of technology)
- CA<sub>t</sub>** = current account (deficit)
- T<sub>t</sub>** = the level of technology

Note that  $\beta_4$ ,  $\beta_3$ ,  $\beta_5$ ,  $\beta_6$  and  $\beta_7$  are expected to have positive relationship, while  $\beta_2$  is expected to be negative.  $\beta_1$ ,  $\beta_5$  and  $\beta_8$  are unpredictable.

**Sources of Data**

Data for net FDI flow and Gross National Product (GNP) are available in International Financial Statistic Yearbook, however the data for FDI is available from 1974 onward. The approved FDI in manufacturing is used as a proxy for this study. Since this study specifically focusing in manufacturing sector, therefore the use of approved FDI in manufacturing should be reliable.

The data for Gross Domestic Product (GDP) in manufacturing, export in manufacturing, import machinery and domestic inflation rate are collected from Monthly Statistical Bulletin, Bank Negara Malaysia in vari-

<sup>6</sup> import machinery such as electrical machine, scientific and computer

ous issues. The annual data for Current Account and Consumer Price Index are also collected from International Financial Statistics Yearbook and International Monetary Fund.

**EMPIRICAL RESULTS AND DISCUSSIONS**

In this section, the estimates in the equation (1) are obtained by ordinary least squares estimation (OLS) of regression. The McKinnon critical value at the 5% level of significance becomes the basis for rejecting or not rejecting the null hypotheses. If the reported t-test statistics are less than the given critical value, the null hypotheses can be rejected. The results of descriptive statis-

tics and correlations between variables are reported in Table 1.

The results from Table 1 indicate that FDI is related significantly to all variables tested except for exchange rate and percentage of GDP. The FDI is also related positively to all variables, except for balance of current account (CA). For the three measures of income; percentage of GDP, GDP in value, and GNP, the correlations show that GDP(%) and GDP is positively but not significantly correlated so that the inclusion of these variables is not likely to impose collinearity problem. However, it can be noticed that the GNP and GDP are positively perfectly correlated such that one of the variable is sufficient to represent the variable being tested.

**Table 1.** Results on the descriptive statistics and correlations between variables

	Mean	Std Dev	FDI	XCHG	CPI	GDP%	GNP	GDP	XPOT	MPOT	CA
FDI	4955.07	6221.19	1								
XCHG	2.66	0.45	0.271	1							
CPI	71.10	23.86	0.657**	0.483**	1						
GDP%	6.85	4.07	0.301	-0.324	-0.202	1					
GNP	98304.17	84139.20	0.652**	0.649**	0.945**	-0.161	1				
GDP	103769.37	88991.03	0.649**	0.654**	0.945**	-0.165	1.000**	1			
XPOT	75725.95	86795.93	0.569**	0.726**	0.889**	-0.220	0.977**	0.978**	1		
MPOT	68825.73	77408.60	0.640**	0.680**	0.901**	-0.141	0.991**	0.991**	0.986**	1	
CA	-2540.23	8081.90	-0.422**	0.264	-0.168	-0.466**	-0.153	-0.146	-0.004	-0.157	1

Notes: \*\* and \* denote significant at 1% and 5% level, respectively. See text for variable definitions and sources.

Table 2 reports the results of the OLS of FDI on the independent variables. The results shown also have been estimated in the full model (Model I) and different sub-models (Model II, Model III and Model IV). Based on the results in Table 2, the GDP in value is removed from the full model (model I) as suggested in the SPSS output. Since GDP and GNP measures are perfectly correlated, the inclusion of GNP in the equation should be adequate. Thus, the results for each model can be explained as follow:

**Model I**

The results obtained from running this model indicate 71.5 percent of the variation in FDI level is explained by all the 7

variables examined in the study. However, on the individual variable the results suggest that only four factors are significant in predicting the FDI level in Malaysia, namely CPI, GDP%, Import and Export. FDI seems to increase with increases in CPI, GDP%, and import but decreases as export increases.

**Model II**

By taking out the insignificant factors from Model I generate a sub-model, Model II. The simplifying the equation obvious reduces the predictive power of the relationship ( $R^2$ ) and causing two more variables to be insignificant (import and export).

**Table 2:** Results of the OLS or regressions of FDI on the independent variables

	<b>Model I</b>	<b>Model II</b>	<b>Model III</b>	<b>Model IV</b>
Constant	-28118.5 (-2.238)**	-10047.6 (-2.297)**	-13647.2 (-4.770)***	-7220.4 (-2.595)**
CPI	443.8 (2.304)**	146.3 (2.058)**	195.0 (6.231)***	171.245 (4.607)***
GDP%	646.246 (2.987)***	519.4 (2.486)**	691.1 (3.763)***	
XPOT	-0.306 (-2.199)**	-0.090 (-1.567)		
MPOT	0.515 (2.200)**	0.114 (1.676)		
XCHG	3249.1 (1.094)			
GNP	-0.232 (-1.457)			
CA	0.395 (1.517)			
R <sup>2</sup>	0.715	0.665	0.627	0.431
F-value	7.903	12.388	22.684	21.226
Sig-value	.000	.000	.000	.000

Notes: \*\*\*, \*\*, and \* indicate significance at 1, 5, and 10 percent level, respectively. See text for variable definitions and sources.



### **Model III and IV**

By simplifying further the equation yields even lower  $R^2$  as only 62.7 percent and 43.2 percent of the variation in FDI are produced in Model III and IV, respectively. However, the reduced models reveal that the remaining variable(s) in these equations are the more important factors in determining FDI compared to import and export. Overall, the results indicate that there are at least four factors that may be used to predict the level of FDI in Malaysia. These variables are CPI, GDP%, import, and export.

### **CONCLUSIONS, LIMITATIONS AND FUTURE RESEARCH**

Numerous studies support the importance of foreign capital in expanding the economic growth. In this study, some variables are chosen to determine factors influencing FDI in Malaysia. Gross national product (GNP) used as a proxy of the market size, gross domestic product (GDP) in manufacturing sector is chosen as a proxy for the degree of industrialization. Other equally important factors are inflation rate, manufacturing export, current account balance, the level of technology and human capital. Malaysia has many advantages to attract more FDI, in terms of maintaining the inflation rate, expanding the market size domestically and internationally. In addition, Malaysia is making successful efforts to upgrade the level of infrastructure and the development of telecommunication, which are very important elements in attracting more foreign investors.

Overall, the results suggest that there are at least four factors that may be used to predict the level of FDI in Malaysia. These variables are inflation rate, gross domestic product (GDP), import, and export are among the main determinants of FDI in Malaysia. However, attracting FDI is not easy in the new era of globalization, which has seen China with huge domestic demand,

resources and labors open the market to all the countries in the world. Therefore, it is suggested that the Malaysian government need to prepare high quality skilled labor and supporting research and development activities. It is a challenge to Malaysia to improve on human capital stock through skilled labor. Skilled labor is required for absorbing, using and improving the technology. Thus, educational competences, particularly in technical and managerial areas, are gaining importance. In this case, Malaysia needs to emphasize the upgrading of the level of education by increasing the number of universities, center for technical training, center of research and development, and distance learning.

FDI can be a vehicle for the adoption of new technology. Therefore, the workforce should be prepared to work with these new technologies. This suggests that there might be an effect of FDI on human capital accumulation (Bernstein et al, 1998). Empirical studies done by Yeaple (1999) found that for more skill-intensive industry, affiliate sales are positively correlated with average education attainment in host country. Dowling et al (2000) define technologies capabilities for foreign investor as skills, education and research and development.

Moreover, Hanson (2001) states that countries with large supplies of human capital are more likely to attract FDI especially in sectors, which are relatively intensive in the use of skilled labor. In addition, Malaysia also must be able to take a greater advantage of the access to scientific and technical information that exists within the global information infrastructure. Enabling technology in information and communication (ICT) is a need for modern knowledge and economy (Dowling, 2000).

In this study, some important variables are left out due to insufficient data such as wages or labor cost, research and development, the ability of energy, tax in-

centives, political stability and policy liberalization. Therefore, it is suggested that the future research should take them into account.

Since the annual data are used in this study that covers from a period of 1970 to 1999, it is recommended that quarterly data

be used to improve the accuracy of the model's estimation. Furthermore, the relatively small sample may require the application of non-parametric methods that is supported by the results of normality distribution test. Further studies should be done by extending to more countries.

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