

Foreign Direct Investment And Economic Growth: A Simultaneous Model

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Foreign Direct Investment (FDI) has been considered as one of the major factors underlying the economic growth experienced by many developing countries. In Malaysia, FDI has played an important role not only in stimulating economic growth, it has also contributed significantly to the growth of the industrial sector and the transformation of the Malaysian economic structure from agricultural into major producer and exporter of manufactured goods. However, the race for FDI has become increasingly competitive especially in view of the emergence of China as new destination for FDI. This paper examines the influence of Foreign Direct Investment (FDI) over the growth of the country – Malaysia for the period of 1970 – 2003. It is found that FDI has significantly influence on the growth rate of the Malaysian economy. In addition, multiple regression analyses are performed to determine the relationship between the specific determinants and FDI inflow to the country. Using the results, conclusions are drawn about the relationship among the determinants in their effects on FDI. The results of the of the FDI determinants model show that economic growth, growth of export, exchange rate, current account balance and public development expenditure has a more direct impact on FDI.

Field of Research: Foreign Direct Investment, Growth

1. Introduction

The spectacular growth of Malaysian economy between 1960-1990 earned Malaysia the designation of being one of the “East Asian Miracles” [World Bank 1993]. The steady rate of growth achieved over such a long period is remarkable. The economy achieved annual growth averaging 6 percent growth per annum in

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the 1960s, improving to 7.3 percent during 1970-75. The Malaysian economy performed better in 1976-80 when the GDP growth rate was 8.6 percent per annum. This was followed by a slower growth rate of 5.1 percent per annum in 1981-85 and again picking up to 6.7 percent per annum in 1986-90. During the period 1991-95 the economy grew even faster at 8.7 percent per annum, and then followed by a slower growth rate of 4.6 percent per annum in 1996-2000.

One of the notable strategies of the government to spur its growth is by attracting foreign direct investment (FDI). Malaysia is one of the most active among the ASEAN countries in liberalizing its investment regime in the manufacturing sector during the 1980s and 1990s. Significant progress was seen during the 1980s under the administration of the former Prime Minister Dr. Mahathir Mohammad, where new joint venture projects (especially with Japanese and Korean) with the state owned enterprise were launched. With the promotion of the Investment Act in 1986, Malaysia experienced a huge influx of FDI bringing with them better technology and know-how. This policy offered many incentives including pioneers status tax holidays, expanded investment tax allowances for expansion projects, tax deduction for export promotions, the establishment of Free Trade Zones and other types of incentives to draw FDI. In fact, Malaysia further improved trade liberalization by relaxing the restrictions over capital ownership of foreign companies hence improving the FDI flows into Malaysia in the late 1980s. Similarly tariff rates in Malaysia have declined considerably over the years. FDI is intended to augment the production capacity of the host country, and take entrepreneurial risks for profits. Comparative location advantages mainly direct the investors in their choice of destination albeit other factors are now assuming importance.

This study proposes to analyze the impact of FDI on growth of the Malaysia manufacturing sector. It uses a framework that accounts for the endogeneity of and interactions between FDI and growth using a relatively a more recent data compiled from various sources. The second objective of the paper is to examine factors that determine FDI inflows into the country. Knowing what factors will influence FDI can lead to useful policy implications. Simultaneous equation system approach will be used in estimating both relationships. The layout of this paper is as follows. The next section provides information on the background of the FDI inflows into Malaysia. This is followed by theoretical framework and a description of the empirical model, followed by a literature review on FDI and economic growth. The following section explains the data sources, followed by discussion of the results. The sixth section concludes the paper.

2. FDI Flows into Malaysia.

For the past two decades, Malaysia has been receiving a lot of foreign direct investments. Even though total foreign investments have generally increased over the years, however, since the early 1990s, there have been several periods of slowdowns. In 1993 FDI dropped drastically due to a slowdown in investments from two main sources of investments for Malaysia - Japan and Taiwan. One of the main reasons for this slowdown is the rise in wage rates in Malaysia relative to other Southeast Asian countries (such as Vietnam and Indonesia). Investments from the USA were relatively stable because some of the investments were in the petroleum and petroleum products sector which were not affected by increases in wages in the manufacturing sector. The currency crisis of 1997 that affected almost all of the countries in Southeast Asia also served to reduce investments into Malaysia. However, investments from USA are also largely unaffected. Moreover the drastic depreciation of the Malaysian Ringgit vis-à-vis the US Dollar also resulted in an increase in the value of those investments. Since 1980, the country has maintained an open policy towards trade and investment. As a result, FDI has played an important role in the capital formation and hence, the development of the economy. As can be seen in Table 1, in the 1990s, FDI inflows contributed to almost a quarter of the country's annual Gross Fixed Capital Formation and equivalent to over 8% of the country's GDP.

Table 1: Foreign Direct Investment (FDI) and Capital Formation in Malaysia

| Year | FDI (RM millions) | GDP (RM millions) | GFCF (RM millions) | FDI as a % of GDP | Openness ^a |
|------|----------------------|----------------------|-----------------------|----------------------|-----------------------|
| 1980 | 2,073.48 | 53,308 | 16,597 | 3.9 | 0.9706 |
| 1985 | 1,674.95 | 77,547 | 23,124 | 2.2 | 0.8828 |
| 1990 | 7,049.70 | 115,701 | 37,855 | 6.1 | 1.3722 |
| 1991 | 10,996.96 | 132,381 | 30,599 | 8.3 | 1.4755 |
| 1995 | 14,770.10 | 218,671 | 107,825 | 6.8 | 1.7324 |
| 2000 | 14,394.40 | 343,215 | 87,729 | 4.2 | 1.9978 |
| 2005 | 14,995.26 | 495,239 | 98,930 | 3.0 | 1.9542 |

^a Openness is computed by (Export + Import)/GDP current prices

Table 2: Mean values of the variables (RM millions)

| Periods | FDI | ΔGDP | ΔEXP | EXC | DEV | CAB | CF | ASSET |
|-----------|----------|----------|----------|-------|----------|----------|----------|-----------|
| 1970-1980 | 899.9 | 5,294.8 | 2,101.6 | 2.513 | 2,667.0 | 235.3 | 886.8 | 81,768.1 |
| 1981-1990 | 2,846.7 | 7,607.6 | 5,147.4 | 2.495 | 8,396.9 | -1,831.8 | 376.4 | 188,359.5 |
| 1991-2003 | 13,275.8 | 15,760.8 | 24,654.7 | 3.257 | 20,331.2 | 10,538.1 | 10,277.8 | 486,021.4 |

One of key policies of Malaysian government is to welcome foreign investment projects that add to resources and potential of the country, engage in new activities and generally promote the development of the economy that is, projects that involve transfer of technology, creation of skilled jobs and contribution of capital.

3. The Theoretical Framework and Review of Literature

In order to analyze the impact of FDI on economic growth, we will use a modeling framework that accounts for the simultaneity in the determination of FDI and economic growth. Accounting for the simultaneity of the above variables allows first to avoid the shortcomings of previous studies that deal with each variable separately. Second, the simultaneous treatment of FDI and economic growth is useful from a policy perspective in the sense that it enables decision makers to choose the combination of mutually beneficial and mutually exclusive policies that have positive impact on all these two variables.

3.1 Role of FDI on Economic Growth

A Cobb-Douglas production function used in this analysis is written as

$$Y = AK^{\beta_1}L^{\beta_2}FDI^{\beta_3}e^{\mu} \quad (1)$$

or $\ln Y = \ln A + \beta_1 \ln K + \beta_2 \ln L + \beta_3 \ln FDI + \mu \quad (2)$

where

- Y = value of output
- K = value of fixed asset
- L = number of employment
- FDI = foreign direct investment inflows into Malaysia (US\$ millions)
- μ = error terms

3.2 Determinants of FDI

There are several theories in the literature which provide details of determinants of FDI inflows. By and large it can be divided into two streams of arguments: micro and macro perspectives. The micro perspective include industrial organization, transaction cost theory, internalization theory and the eclectic paradigm. While, the macro level theory includes orthodox trade theory, Kemp-MacDougall theory and product cycle theory. Besides that, there are still other specific determinants such as exchange rates, market size, government policies and incentives, political risk, cost of labour, labour skills, trade openness and export orientation policy and infrastructure. However, the main theory adopted in this paper are drawn from Dunning (1977; 1993) who suggested that the main factors that drive FDI inflows have been the need to secure market access, the opportunities presented by large scale privatization processes and the degree of political and economic stability.

The eclectic paradigm of Dunning, also known as OLI, proposes that the undertaking of FDI is determined by the realization of three groups of advantages and they are:

- Ownership – specific advantages – these arise from the firm's size and access to markets and resources, the firm's ability to coordinate complementary activities like manufacturing and distribution and the ability to exploit differences between countries.
- Locational advantages – this includes differences in country natural endowments, transport costs, macroeconomic stability, cultural factors and government regulations. These help to determine which countries are host to MNCs foreign production.
- Internationalisation incentives – this arises from exploiting imperfections in external markets. These include the reduction of uncertainty and transaction costs in order to generate knowledge more efficiently and the reduction of state – generated imperfections such as tariffs, foreign exchange controls and subsidies.

The model specification used in this paper is stated as follows:

$$FDI_t = \beta_0 + \beta_1 \Delta GDP_t + \beta_2 \Delta EXP_t + \beta_3 EXC_t + \beta_4 DEV_t + \beta_5 CAB_t + \beta_6 CF_t \quad (3)$$

| | | |
|-------|--------------|--|
| Where | FDI | = foreign direct investment inflows into Malaysia (US\$millions) |
| | ΔGDP | = change in real GDP – 2000 prices (RM millions) |
| | ΔEXP | = growth of exports |
| | EXC | = exchange rate RM=US\$1 |
| | DEV | = public development expenditure (RM millions) |
| | CAB | = current account balance (RM millions) |
| | CF | = capital outflow from Malaysia (RM millions) |

Change in real GDP. GDP is the most important factor influencing FDI flows. The changes in the level of real GDP of a host country reflect the purchasing power of a country and its market size. Root and Ahmed (1979), Bhattacharya et al (1996) suggest that a growing market increases the prospects of market potential and a large market size would generate economies of scale. While, Scaperlanda and Mauer (1969) suggest that FDI responds positively to the market size and many empirical studies in developing host countries have confirmed this hypothesis.

Change in exports: The change in export indicates the increase export from Malaysia and the integration with the world economy. Hassan (2003) explained that the growth of exports is increasing fast and improves the foreign investors' confidence in Malaysian economy.

Exchange rate: In the foreign exchange market, an appreciation in exchange rate would cause a depreciation of domestic currency against US dollar. Normally trade in Malaysia usually uses the term of US dollar in their transaction. So, FDI

is hypothesized to increase in response to the depreciation in Malaysian Ringgit. Nakamura and Oyama (2001) suggest that the exchange rate is the choice for MNCs to select FDI destinations.

Public development expenditure: To attract inward FDI, good infrastructure must be provided by the government. Development expenditure indicates the expansion of various infrastructure facilities such as transportation and communication, power supply, labour skill and knowledge.

Current account balance: Current account balance implies the financial health of a host country. Schneider and Frey (1985) found that the current account deficit will contribute to a negative effect on FDI on balance of payments. Meanwhile, Hassan (2003) proved that current account surplus giving positive impact on FDI inflows.

Capital outflow from Malaysia: Capital flight can be defined as the outflow of capital from a country due to economic and political risks. The relationship between capital flight and FDI is hypothesized to be negative. Kant (1996) highlighted the FDI is raising and capital flight is decreasing after improvement in investment climate.

3.3. Review of Literature

A wide range of literature is available on the literature on the issue of the impact of FDI on economic growth. By employing the production function, these studies use a range of methodologies; e.g Granger causality test, panel data estimation, and error correction model. In this section, we review the most recent studies linking FDI and economic growth. Marwah and Takavoli (2004) examined the effect of FDI and imports on economic growth in four Asean countries. The elasticity of the estimated production function of FDI was found to be significant in explaining the economic growth of all the four countries. Estimated foreign capital elasticity was found to be 0.086 while import contributed 0.443 to growth in the case of Malaysia. Clearly, they conclude that both FDI and imports had a significant impact on growth.

Recent study by Li and Liu (2005), on the other hand, uses the panel data of 84 countries to investigate the influence of FDI on growth. The study found a significant relationship between FDI and economic growth. Additionally, a stronger relationship was extracted when FDI interacted with human capital. This is because stronger human capital poses better absorptive capacities due to the complementary nature of the FDI and the human capital, most importantly for the developing countries. In contrast, there have been several studies indicating a negative or no relationship between FDI and growth. Akinlo (2004) investigated the impact of FDI on economic growth in Nigeria using the ECM showed an insignificant negative influence of FDI on growth. The author further argued that extractive FDI might not extract significant impact on growth compared to the FDI

in manufacturing sector. Additionally, FDI may influence growth negatively once there is an evidence of the foreign investors transferring profits, or other investment gains to their home country. Other noteworthy studies examining the influences of FDI employs the Granger causality test (Knoldy, 1995; Nair – Reichert and Weinhold, 2001) but the results vary according to country, method used and time frame under study.

4. Data sources

Data on GDP, capital, labour, foreign direct investment, exchange rate, public development expenditure, capital outflow, export and current account balance over the 1970 – 2004 period are obtained from Economic Report published by the Ministry of Finance, Malaysia. All variables in value terms are measured in 1987 Malaysian Ringgit. Data on number of foreign companies, percentage of employed person acquired tertiary education are obtained from *Monthly Statistical Bulletin, Quarterly Statistical Bulletin and annual report* published by Bank Negara Malaysia.

5. Analysis of Results

First, the augmented Dickey – Fuller (ADF) unit root test was conducted to examine whether each series of interest are stationary or not. The ADF test showed that all the series were stationary and a co-integration test was also conducted to check if these variables have any long-run equilibrium relationship. The test showed that there is a long –term relationship between FDI and the other series. Then equations (2) and (3) are estimated simultaneously using two stage least squares. The results of the estimation are shown in Table 2.

Table 3: Regression results

| Variable | Dependent Variable | |
|-----------|--------------------------|---------------------------|
| | GDP | FDI |
| Intercept | 3.179028** (1.48427) | -3344.442** (1627.397) |
| K | 0.605666*** (0.06618) | |
| L | 0.260042* (0.14188) | |
| FDI | 0.010285* (0.00534) | |
| CGDP | | 0.078913*** (0.03535) |
| DEXP | | 0.030300* (0.01771) |
| EXC | | 1397.336** (675.464) |
| DEV | | 0.078390** |

| | | |
|-----|--|---------------------------------------|
| | | (0.03995) |
| CAB | | -0.080923 ^{***} (0.02044) |
| CF | | -0.028066 (0.02081) |

Figures in parentheses are standard errors

*** - significant at 1 per cent

** - significant at 5 per cent

* -significant at 10 per cent

In equation (2), collectively there was significant relationship between output (GDP) and all its inputs. Individually, each input also has significant relationship with output. Domestic capital input is significant at 1%, whereas labour and FDI are significant at 10% level. An increase of 1% of FDI will increase output by 0.01% only. In contrast, an increase of 1% of domestic capital and labour will increase output by 0.6% and 0.26% respectively.

Table4: Granger bi-variate F-test for casuality

| Null Hypothesis: | Obs | F-Statistic | Probability |
|---------------------------------|-----|-------------|-------------|
| FDI does not Granger Cause DGDP | 31 | 5.33848 | 0.01142 |
| DGDP does not Granger Cause FDI | 31 | 6.11893 | 0.00664 |
| FDI does not Granger Cause DEXP | 31 | 4.48403 | 0.01233 |
| DEXP does not Granger Cause FDI | 31 | 2.85583 | 0.05827 |
| FDI does not Granger Cause EXC | 32 | 4.01283 | 0.02980 |
| EXC does not Granger Cause FDI | 32 | 5.38203 | 0.01079 |
| FDI does not Granger Cause DEV | 28 | 1.90376 | 0.14603 |
| DEV does not Granger Cause FDI | 28 | 2.30916 | 0.08839 |
| FDI does not Granger Cause CAB | 31 | 1.79332 | 0.17535 |
| CAB does not Granger Cause FDI | 31 | 2.48690 | 0.08481 |
| FDI does not Granger Cause CF | 32 | 5.28660 | 0.01155 |
| CF does not Granger Cause FDI | 32 | 1.18058 | 0.32246 |

Results from the estimation of equation (3) are also presented in Table 2. This is an attempt to test the relationship between various factors and FDI discussed earlier. The current account balance and capital outflow have a negative impact on FDI. The coefficient for the current balance is negative and statistically significant at 1 per cent level. The estimate implies that an increase of the current account balance by 1 percentage point leads to a 0.08 percentage point decrease in the FDI. As current account balance improves in favour of Malaysia, RM appreciates and drives away FDI. Notice that CAB Granger caused the FDI and the reverse was not true – i.e in Malaysia the relationship between the two variables has been unidirectional (see Table 3). The negative sign of the capital flight is expected. However, the variable is not significant. Therefore the hypothesis of negative relationship between capital flight and FDI is not well supported by the data.

As expected other variables have positive influence on FDI. The regression results indicate a positive relationship between FDI and exchange rate, which also confirms the literature that argues that exchange rates are expected to affect FDI inflows because they affect a firm's cash flow, expected profitability and the attractiveness of domestic assets to foreign investors (Erdal and Tatoglu 2002; Maniam 1998). Moreover, as exchange rate increases, the higher the FDI. Exchange rate increases mean that RM depreciates, it needs more of RM to get USD1 and for foreign investors it means that with the same amount of foreign currency they get more of RM, hence FDI increases. The hypothesis of positive relationship between changes in GDP and FDI inflow is well supported and significant at 1%. This is to explain why Malaysia keeps focusing on promoting economic growth as one of the reasons to attract inward FDI. Foreign investors may consider economic growth and expected potential growth in a host country to choose their investment location. Furthermore, the finding also supports the theory of locational advantages which argues that market size and availability of infrastructure in a host country can attract FDI. It is also interesting to note that, the relationship between exchange rate and FDI, changes in GDP and FDI, and change in export and FDI are all bilateral causality. Exports play a crucial role in attracting foreign capital to Malaysia. A 1% rise in change of exports is likely to increase FDI inflow by 0.03% . Public development expenditure also has positive influence on FDI. A 1% rise in public development expenditure is likely to increase FDI inflow by 0.08%. Development expenditure indicates the expansion of various infrastructure facilities such as transportation and communication, power supply, labour skill and knowledge.

6. Conclusion

This paper has looked at the influence of Foreign Direct Investment (FDI) over the growth of the country and the determinants of FDI in Malaysia. The empirical investigation found that FDI has played an important role in stimulating the growth of the Malaysian economy and a strong market and macroeconomic stability promote FDI while current account balance and capital flight have the opposite result. This suggests that a strong market and macroeconomic stability encourages foreign investment in Malaysia while current account balance and capital flight discourage foreign investment. As a whole, since FDI have become increasingly important, the policy direction focusing on human capital, improving productivity and innovative capabilities of the economy (especially manufacturing sectors) and strengthening the supporting industries and institutions are proposed. This in turn will promote and make Malaysia as an attractive destination fro FDI. Lately, FDI inflow is steadily decreasing annually because China is now posing as a serious competitor; it has a large domestic market, it is seriously liberalizing its FDI regime, it has wealth in skilled and unskilled manpower, it has low labor costs compared to Malaysia. In this respect, Malaysia needs to reduce the high labor costs in order to compete with rival China. In the longer term, instead of its direct dependency on FDI, Malaysia should concentrate on developing new industries for their individual growth and not

solely for purposes of FDI inflow. If such a change in attitude is adopted, there would be a rapid industrial advancement in the country and this will ultimately lead to a growth in FDI.

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