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Determinants of Foreign Direct Investment in the Malaysian Manufacturing Sector

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ABSTRAK

Pelaburan langsung asing (PLA) telah memainkan peranan yang penting dalam perkembangan sektor perkilangan di Malaysia. Malangnya, corak PLA tersebut adalah tertumpu kepada beberapa industri tertentu seperti barangan eletronik dan tekstil yang kurang melibatkan tenaga buruh yang mahir, kurang intensif teknologi dan sangat bergantung kepada input yang diimport. Hal ini telah mengakibatkan beberapa masalah seperti asas industri perkilangan yang sempit, mudah dipengaruhi oleh pergolakan (ekonomi) luar negara serta nilai tambah yang rendah. Oleh yang demikian, adalah perlu untuk memperluaskan asas industri perkilangan dan juga menggalakkan lagi perkembangan industri yang berasaskan sumber (tempatan). Kajian ini melihat beberapa faktor (kuantitatif) yang mempengaruhi PLA di sektor perkilangan Malaysia. Keputusan kajian menunjukkan bahawa keadaan ekonomi negara, kestabilan matawang, kemudahan kewangan tempatan, kemudahan infrastruktur, kemudahan tenaga buruh serta insentif pelaburan adalah di antara faktor-faktor yang mempengaruhi PLA di dalam sektor perkilangan di Malaysia.

ABSTRACT

Foreign direct investment (FDI) has played a significant role in the development of the Malaysian manufacturing sector. Unfortunately, the pattern of FDI is unevenly concentrated in a few industries such as electrical and textile which involve less skilled labour, less intensive technology and are highly dependent on imported inputs. This has led to the problems associated with a narrow manufacturing base, vulnerability to external fluctuations as well as low value added. It is therefore necessary to promote a broader manufacturing base and to further encourage FDI in resource-based industries. This study attempts to look at several quantitative factors that influence FDI in the Malaysian manufacturing sector. The results of the study indicate that a nation's economic health, currency stability, access to local financing, availability of adequate human and physical infrastructures as well as investment incentives are among the important factors influencing FDI in the manufacturing sector of Malaysia.

INTRODUCTION

Foreign direct investment (FDI) has played a substantial role in the development of Malaysian manufacturing industries. Many of the multinational corporations (MNCs) which are involved in direct investment in the Malaysian manufacturing sector have brought with them technological knowhow and business experiences that have contributed to the development of the manufacturing sector and the economy as a whole (Fong 1988 and Beaumont 1990). In addition, MNCs have also been credited for enhancing the competitiveness of the Malaysian manufacturing exports in the world market by improving product qualities (Yusof, 1990).

The government on its part has been encouraging private sector investment (especially FDI) more actively since the mid-eighties when the country was experiencing one of its worst recessions. The Investment Act was introduced in 1986 to further stimulate investment activities in various manufacturing industries. This has generated positive results with more foreign investors coming into the country. The share of

foreign proposed capital investment in the approved manufacturing projects has increased from 19% in 1984 to 64% in 1992 of the total proposed capital investment. The trend in FDI (in terms of proposed capital investment) in Malaysian manufacturing indicates a sharp increase during the 1984-90 period (Table 1).

TABLE 1
Proposed capital investment in approved manufacturing projects in Malaysia(RM Million)

Year	Local	Foreign	Total
1984	3083.1	718.0	3801.1
	(81%)*	(19%)	(100%)
1985	4727.6	959.3	5686.9
	(83%)	(17%)	(100%)
1986	3475.3	1687.9	5163.2
	(67%)	(33%)	(100%)
1987	1873.9	2060.0	3933.9
	(48%)	(52%)	(100%)
1988	4215.9	4878.0	9093.9
	(46%)	(54%)	(100%)
1989	3562.7	8652.7	12215.4
	(29%)	(71%)	(100%)
1990	10539.0	17629.1	28168.1
	(37%)	(63%)	(100%)
1991	13763.1	17055.3	30818.4
	(45%)	(55%)	(100%)
1992	10003.0	17772.1	27775.1
	(36%)	(64%)	(100%)
1984-92	55243.6	71412.3	126656.0
	(43.6%)	(56.4%)	(100%)

Source: MIDA, 1993
*Percentage (rounded to the nearest digit)

Despite the overall increase in FDI, foreign participation (in terms of capital) across the manufacturing industries continues to be uneven. Some of the industries are over invested while others appear to be overlooked by foreign investors. For example, as at December 1988, in the electrical industry, foreign share constituted 81% of the industry's total fixed asset, while for the beverages and tobacco; rubber products; and textile industries, the foreign shares were 70, 56 and 53% respectively. In contrast, foreign share in the total fixed asset for the wood and wood products; plastic; and chemical industries represented only 14.6%, 17.8% and 21% respectively of the industry's total fixed asset (MIDA 1990).

The uneven pattern of FDI across the manufacturing industries has resulted in a narrow manufacturing base. At present, manufacturing activities are highly concentrated in the electrical and textile industries. The narrow manufacturing base appears to be at odds with the country's diversification policy originated in the 1960's. The narrow manufacturing base also has several negative implications in terms of the structure of employment, export and value added. The employment pattern in the manufacturing sector is concentrated in the electrical and textile industries. As at December, 1991, the electrical industry provided the highest level of employment (22.7% of the total employment in the manufacturing) followed by the textile industry, 15.2% (Table 2). In terms of exports, electrical products (electronic, electrical appliances and machinery) have accounted for the majority of the share of the export of manufactures. In 1992, the share of electrical products in the total manufactured exports was 57.5% (Table 3).

TABLE 2
Malaysia: employment by industry as at December, 1991

Industry (SITC)	Employment (%)
Food, Beverages	63,741
& Tobacco (311-313)	(9.2%)
Textiles, Clothing	92,273
& Footwear (321-323)	(13.3%)
Wood Products (331)	56,694
	(8.2%)
Rubber Products (355)	43,231
	(6.2%)
Chemicals & Petroleum	21,986
Products (351-353)	(3.2%)
Non-Metalic	26,310
Mineral Products (369)	(3.8%)
Metal Products (371)	39,678
	(5.7%)
Electrical & Electronic	211,046
Machinery & Appliances (383)	(30.5%)
Transport Equipment (384)	26,098
	(3.8%)
Other Manufactures	111,225
	(16.1%)
Total	692,282
	(100.0%)

Source: MIDA, 1993

TABLE 3
Malaysia: export of manufactured goods (RM millions)

	1970		1980		1985		1989		1990		1991		1992	
Total	(100)	612	(100)	6101	(100)	12111	(100)	36567	(100)	46833	(100)	61427	(100)	38443
Food, Beverages & Tobacco	(18.3)	112	(7.8)	475	(4.9)	594	(5.0)	1788	(4.4)	2062	(3.7)	2243	(3.6)	1365
Textiles, Clothing Footwear	(6.5)	40	(13.2)	806	(10.6)	1289	(8.7)	3190	(8.5)	3983	(7.8)	4805	(7.5)	2874
Wood Products	(14.4)	88	(7.6)	467	(3)	363	(3.2)	1184	(2.9)	1362	(3.4)	2063	(3.8)	1466
Rubber Products	(2.8)	17	(1.4)	84	(1)	133	(3.1)	1148	(3.3)	1534	(2.8)	1749	(2.9)	1131
Chemicals & Petroleum Products	(32.2)	197	(5.9)	361	(11.6)	1412	(7.4)	2698	(6.8)	3174	(5.8)	3539	(6.4)	2461
Non-Metalic Mineral Products	(3.3)	20	(1)	61	(1.2)	150	(1.8)	658	(1.6)	771	(1.4)	888	(1.3)	509
Metal Products	(4.2)	26	(2.6)	161	(2.5)	300	(4.0)	1463	(3.5)	1625	(3.1)	1883	(3.1)	1208
Electrical & Electronic Machinery & Appliances	(2.8)	17	(46.4)	2832	(49.8)	6028	(56.9)	20799	(56.6)	26504	(57.9)	35602	(58.4)	22440
Transport Equipment	(11)	68	(6.7)	407	(8.5)	1031	(3.2)	1184	(4.1)	1927	(5.4)	3292	(4.9)	1894
Other Manufactures	(4.5)	27	(7.3)	447	(6.9)	831	(6.7)	2455	(8.3)	3891	(8.7)	5363	(8.1)	3095

Note : Figures in parentheses denote percentages
Source : Malaysia, Ministry of Finance, Economic Report, various issues

The electrical industry has also accounted for the major portion of the manufacturing value added. In 1990, electrical machinery contributed 21.5% of the total manufacturing value added, while chemical and chemical products contributed 10.7% and food contributed 8.3% (Malaysia, Industrial Surveys, 1992).

The highly dominant electrical and textile industries, in terms of employment, exports and value added, indicate the narrowness of the country's manufacturing base and its vulnerablity to external changes in terms of world supply and demand for the products of the two industries. Should there be any severe drop in the demand for these products in the world market, the employment, exports as well as economic growth, in the country could be greatly disturbed.

In addition, most of the multinational corporations or MNC- owned electronics and electrical appliances plants (which are mainly off-shore plants) are engaged in the assembly processes of integrated circuits (ICs), industrial equipment and consumer appliances like air-conditioners, radios and television sets from completely knocked-down imported units for the local and export markets (Fong, 1988). The nature of the Malaysian electrical industry (highly dependent on the imported inputs) has been the main reason why the industry value-added is relatively low (Chalmers 1991).

The purpose of this paper is to report on a study of several country related factors that are considered important when decisions on FDI are made by MNCs. While this study may not provide specific recommendations for the promotion of a broader manufacturing base and encourage FDI in the under invested industries, it would be able to provide a general redirection for the current FDI policies and incentives.[1]

SPECIFICATION OF FOREIGN DIRECT INVESTMENT FUNCTION

Attempts at explaining FDI have appeared in three major strands of theoretical framework. These different theories are important and helpful in understanding the international firms' operations. Basically, analysis of FDI has used the comparative advantage theory, industrial organization theory and investment theory (Rock, 1973).

In specifying the FDI function, various country related aspects which influence FDI in Malaysian manufacturing are considered. It is assumed that multinational firms take into account several aspects of the host country in their FDI decision process to reduce the investment risks, minimize the factor costs and maximize their profits. Selection of the variables is based on previous findings on the determinants of FDI (Rock 1973, Goh 1973, Ahmed 1975, Schneider and Frey 1986 and Bardai 1989). For the purpose of this study, we are especially interested in several economic factors. Accordingly, an FDI function for the Malaysian manufacturing sector can generally be written as:

$$Y = f(GNP, MOG, ER, INT, INF, TBA, CPFC, FGDE)$$

where Y is the dependent variable. Two different proxies for the dependent variable were chosen for this study, namely: (1) the level of total assets of the foreign controlled firm engaged in Malaysian manufacturing (AFC) and (2) the level of investment in fixed assets by foreign controlled firm engaged in the manufacturing sector of Malaysia (IFC). As defined by Oman (1984), a firm is considered to be involved in FDI if the foreign entity owns a majority of the equities and has direct managerial control in the firm. Thus, for the purpose of this analysis, a manufacturing company with at least 50% of the equities controlled by foreign entities is considered as an FDI company. The total assets of foreign companies include stocks and claims on branches as well as affiliated enterprises abroad, while investment in fixed assets includes acquisition of transport equipment, machinery and office equipment.

GNP (gross national product) reflects the general performance of the economy and provides an indication of the size of the local market for the manufacturing outputs (Rock, 1973). A positive relationship is expected between GNP

[1]Over the years, the government has enacted and implemented various policies to attract foreign investment in Malaysia. Such policies and their respective programmes are well documented and will not be discussed here. For reference see Yong (1988).

and FDI. MOG (Ratio of manufacturing output over GNP) measures the degree of the country's industrialization. It also provides a good hint of the supply conditions of manufacturing inputs such as power, transportation, communication and labour. A higher ratio of manufacturing output over the GNP reflects a better supply of investment inputs. Thus, a direct relationship between MOG and FDI is expected. The ER or Foreign Reserve position provides an indication on the exchange rate risks associated with FDI by showing the degree to which the country's currency is under or over-valued. Foreign investors are likely to incur losses due to exchange rate changes if the currency is over-valued (Rock, 1973). A decline in the foreign reserve position is expected to have a negative impact on FDI. Changes in the levels of external reserve do not directly influence FDI, but will first affect the exchange rate because the foreign reserve position actually provides information on the condition of exchange rate. It is the changes in the levels of exchange rates that will affect FDI. Thus, the effect of the foreign reserve position on FDI is not likely to be immediate. Accordingly, external reserve lagged one period is used for the study.

TBA (total asset of the banking system) provides an important barometer on the availability of local financial services such as local credits and insurance services. FDI is expected to increase with TBA. CPFC or profitability indicates whether the activities of multinational corporations are affected by the opportunity for high profits. This idea is stressed by the investment theory of FDI. To check whether the level of profits in year t has any impact on the level of FDI in year t+1, the amount of profits of foreign controlled companies in Malaysian manufacturing (lagged one period) is used for the analysis. INT (Interest rate) is normally associated with high cost of capital which often leads to the reduction in FDI (assuming that domestic financing is important to the foreign investors). However, in the case of a poorly developed financial market in which FDI projects are constrained by inadequate domestic savings, increase in the interest rates can help raise the domestic savings and finally promote FDI.

FGDE (federal government development expenditure) represents public investment rate. The impact of FGDE on FDI can be positive or negative. FGDE which mainly involves spending on basic infrastructure such as education, transportation systems, water and sewage facilities can complement and thus, promote FDI. Conversely, public investment in projects in which the products compete (for source of funds and other factors of production) with those of the private sector can dampen FDI to an extent that it substitutes the private projects. INF denotes inflation. In most cases, high rates of inflation provide a good indication of economic instability and failure on the part of the government to control the country's macroeconomic environment.

DATA COLLECTION AND MODEL ESTIMATION

Data for the studies were collected from various sources including The Quarterly Economic Bulletin of Bank Negara Malaysia and the Financial Reports of Limited Companies (published by the Department of Statistics). To eliminate the inflationary factor, the relevant data were deflated by the consumer price index (1967=100). Since Malaysia has been independent for only about 33 years and not until mid 1960s were most of the Malaysian data properly recorded, only a relatively small number of observations are available. For the above reasons, annual data covering the period of 1966 to 1988 are used.

A preliminary estimation suggested that heteroscedasticity was present in the models. In order to reduce the problem, all of the dependent and independent variables were transformed into *log* form. The two general equations representing the relationships between eight explanatory variables with FDI which are represented by two dependent variables may be expressed as:

$$\begin{aligned} LAFC = {} & \alpha_0 + \alpha_1 LGNP + \alpha_2 LER + \alpha_3 LINT \\ & + \alpha_4 LINF + \alpha_5 LMOG + \alpha_6 LTBA \\ & + \alpha_7 LCPFC + \alpha_8 LFGDE + \mu_1 \end{aligned} \quad [1]$$

$$\begin{aligned} LIFC = {} & \beta_0 + \beta_1 LGNP + \beta_2 LER + \beta_3 LINT \\ & + \beta_4 LINF + \beta_5 LMOG + \beta_6 LTBA \\ & + \beta_7 LCPFC + \beta_8 LFGDE + \mu_2 \end{aligned} \quad [2]$$

Estimations of equations [1] and [2] (Table 4) indicate the presence of a multicollinearity problem. This is supported by the fact that only

few of the explanatory variables are significant in spite of the high values of R^2 0.9967 for equation [1] and 0.8642 for equation [2]). A partial correlation analysis shows that GDP is highly correlated to total asset of the banking system, and current profit of foreign controlled companies. External reserve is strongly related to the total asset of the banking system. Manufacturing output/GNP and interest rate are also highly correlated to the total asset of the banking system. To reduce the multicollinearity problem, the models were respecified with closely related variables appearing in different equations. The following regression equations were used:

For LAFC as the dependent variable:

$$LAFC = \pi_0 + \pi_1 LGNP + \pi_2 LER + \pi_3 LINT + \pi_4 LINF + \mu_3 \quad [3]$$

$$LAFC = \tau_0 + \tau_1 LMOG + \tau_2 LCPFC + \tau_3 LTBA + \tau_4 LFGDE + \mu_4 \quad [4]$$

For LIFC as the dependent variable:

$$LIFC = \infty_0 + \infty_1 LGNP + \infty_2 LER + \infty_3 LINT + \infty_4 LINF + \mu_5 \quad [5]$$

$$LIFC = \phi_0 + \phi_1 LMOG + \phi_2 LCPFC + \phi_3 LTBA + \phi_4 LFGDE + \mu_6 \quad [6]$$

All of the regression results for equation [3] through [6] are summarized in Table 4. It is shown in equation [3] that gross national product (LGNP), external reserve lagged one period (LER) and interest rate (LINT) are positively related to the LAFC. The t values are significant at the 5% level for the GNP and LINT and at the 1% level for LER. The coefficient for inflation (LINF) shows the correct negative sign as expected. However, its t value is not significant at the 10% level. Equation [4] demonstrates a significant positive relationship between manufacturing output/GNP (LMOG), total assets of the banking system (LTBA) and current profits of foreign controlled companies in manufacturing sector lagged one period (LCPFC) with the dependent variable (LAFC). Their t values are all significant at the 1% level. Public investment (LFGDE) shows a significant negative relationship with the dependent variable. Its t value is less than the critical t value at $\alpha = 0.05$.

Using LIFC as the dependent variable in equation [5], a significant positive relationship between LGNP, LER and LINT with the dependent variable was obtained. The t value for LGNP is significant at the 5% level while for LINT and LER, they are significant at the 10% level. Inflation (LINF) does not show any significant relationship with the dependent variable; however, its slope coefficient shows a negative sign.

Regressing LIFC on LMOG, LTBA, LCPFC and LFGDE in equation [6], it is found that three explanatory variables, namely LTBA, LMOG and LCPFC show significant positive relationship with the dependent variable. The t values for LMOG and LCPFC are significant at the 10% level while for LTBA its t value is significant at the 5% level.

SUMMARY AND POLICY IMPLICATIONS

The analysis presented in this paper reveals that gross national product (GNP), net external reserves, interest rates, manufacturing output/GNP, current profits of foreign controlled companies in Malaysian manufacturing and total assets of the banking system are important factors influencing FDI in Malaysian manufacturing. The significant positive relationship between GNP and the dependent variable is expected because a high level of GNP is normally associated with positive growth and a nation's economic health. The level of external reserve (LER) which indicates the extent to which Malaysian currency is under or over-valued also has a positive impact on the activities of FDI. A low level of external reserve discourages FDI because it leads to overvaluation of a country's currency which can increase the risk of investment activities through the currency exchange loss. The level of interest rate also plays a significant role in FDI decision. In the Malaysian case, increase in interest rate is associated with the increase in FDI. The direct relationship between interest (deposit) rate and savings has been supported by several economists, for instance Shaw (1973). According to them, increase in deposit rates can lead to an influx of deposits into commercial banks which ultimately expands the real size of the banking system and hence raises the net flow of real bank credit to finance investment. Inflation does not seem to be a significant determinant for FDI in Malaysia. A careful review on the trend and degree of infla-

TABLE 4
Results of regressions

Equation	Dep.	Constant	LGNP	LER(-1)	LINT	LINF	LMOG	LTBA	LCPFC(-1)	LFGDE	Adjusted R^2	Durbin-Watson	F-value
[1]	LAFC	1.4337 (4.4981) ***	0.0968 (0.8709)	0.0172 (0.5929)	-0.0533 (-1.1447)	0.0393 (2.7812) **	0.5347 (7.9965) ***	0.4499 (8.4658) ***	0.3357 (8.3840) ***	-0.1101 (-5.0633) ***	0.9967	2.4627	673.11 ***
[2]	LIFC	-1.9022 (-0.4998)	-2.0671 (-1.4203)	0.5764 (1.6269)	1.0397 (2.0114) *	0.1265 (0.8250)	-0.8364 (-.9570)	1.7358 (2.6154) **	0.2538 (0.6037)	0.2114 (-0.8069)	0.8643	2.3873	15.16 ***
[3]	LAFC	0.6694 (0.6921)	0.3642 (2.3765) **	0.2340 (3.2192) ***	0.2064 (2.7512) **	-0.1165 (-0.5599)					0.9923	1.7650	515.43 ***
[4]	LAFC	1.9049 (12.863) ***					0.4866 (5.4876) ***	0.4293 (22.965) ***	0.4437 (15.165) ***	-0.1191 (-4.2023) ***	0.9932	2.0037	585.98 ***
[5]	LIFC	-8.0931 (-6.0935) ***	0.9444 (2.6405) **	0.7060 (1.7986) *	0.9803 (1.7612) *	-0.0544 (-.5291)					0.8716	1.8934	18.93 ***
[6]	LIFC						1.0430 (2.0281) *	0.4749 (2.5419) **	0.5902 (1.9058) *	-0.1296 (-0.4335)	0.7883	1.6986	19.61 ***

Figure in parentheses denote t-values: * significant at 10% level of confidence
** significant at 5% level of confidence
*** significant at 1% level of confidence

tion in Malaysia shows that in general, inflation in Malaysia has been well under control and has not been as severe as in many other developing countries (Yusof, 1985).

The positive relationship between (LMOG) and FDI implies that certain human aspects and physical infrastructure related to manufacturing such as skilled and cheap labour; reliable supply of water and energy; and adequate transportation system for dissemination of the products are important in the eyes of foreign investors. Furthermore, it suggests that the host country's conducive policies can contribute to the increase in FDI. A greater percentage share of manufacturing output in the gross national product also reflects the society's acceptance of the "discipline" of manufacturing industry. Profitability is another important consideration in the FDI decision process. This is confirmed by the strong positive relationship between the lagged value of current profits earned by foreign controlled companies in the Malaysian manufacturing sector and the dependent variable. This relationship shows that foreign investors are quite sensitive to investment incentives which can increase the possibility for higher profits. Accordingly, this finding suggests the possibility of controlling FDI through investment incentives. Furthermore, the analysis demonstrates that local funds and other local financial services including insurance are important factors influencing FDI. The fact is supported by the strong positive relationship between the level of assets of the consolidated banking system and the dependent variable. This finding provides a base for guiding FDI operations in Malaysian manufacturing through credit control or credit allocation policies. In fact, a study by Liete and Vaez-Zadeh (1986) on credit allocation and investment decision in the Korean manufacturing sector has concluded that limitations on credit availability tend to affect investment decision directly rather than through interest rate movements. Finally, the results show a significant negative impact of public investment rate on FDI. Public investment can either be in basic infrastructure (such as education, transportation systems, water and sewage facilities) which would facilitate FDI or in projects for the public sector enterprises where the products compete (for input factors as well as market) with those of the private sector. In Malaysia, the public sector enterprises have been involved in both types of investments. The two different elements of public investments have two different directions of impact on investment activities. Thus, the negative relationship between public investment rate and FDI suggests that public investment activities on balance have an adverse effect on FDI. The negative consequences of government activities via the public sector have been noted by a number of observers. Among these are the reduction of fair competition among the private firms in Malaysia (Ghazali 1988) and the generation of macroeconomic problems such as inflation and balance of payment difficulties (Fischer, 1988).

Several aspects should be considered in the policy making process in order to improve the pattern of FDI in the various manufacturing industries in the country.

First, since certain human aspects and physical infrastructures related to manufacturing are important in the eyes of foreign investors, the provision of a well trained and efficient labour force, special or subsidized industrial sites, and other infrastructural facilities can attract foreign investors to certain designated industries.

Next, the allocation of special funds or credit facilities for firms which participate in industries which are under invested can also increase the flow of FDI into those industries because many foreign firms regard the possibility for local finance as one of the important considerations in their FDI decisions.

In addition, policy makers may also utilize tax incentives in order to improve the pattern of FDI since our analysis shows that increase in profitability is quite an important element in the FDI decision. The use of tax incentives in guiding the FDI activities should however be blended with other incentives (other than tax) in order to be more effective.

It should be borne in mind that the better way to design policies is to first maintain and further elevate the country's attractiveness as an investment ground for foreign investors. Guiding the activities of FDI accross the various industries in the country would be the subsequent step. It is important that the government aim at keeping a steady economic growth, reduce the currency fluc-

tuation, control the inflation, increase the efficiency of the public sector and financial institutions, upgrade the quality of labour force and more importantly, maintain political stability.

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