CHAPTER TWO

FOREIGN CAPITAL AND GROWTH

2.1 Positive Effects of Foreign Capital on Growth

Foreign capital has been an important ingredient to Malaysian economic development, not only in terms of GDP growth, but also in terms of structural changes that have transformed Malaysia from basically a primary producer to a rapidly industrialising economy. Malaysia has, since its independence in 1957, practiced liberal policies towards the inflows of foreign capital. This move must be continued as foreign capital inflows (FCI) is indispensable for Malaysia to become competitive internationally in terms of new products, processes and marketing network. Malaysia's "Vision 2020", which envisages Malaysia as a full-fledged developed country by the year 2020, implies increased economic openness, with FCI playing an increasingly important role in the development process.

It is generally accepted that growth is a function of investment and other factors. FCI, by bringing in new investible funds and foreign exchange, would help the less developed country to achieve higher investment rates and thus accelerate growth.

As Alexander Hamilton said: "Foreign capital instead of being viewed as a rival ought to be considered as a most valuable auxillary, conducing to put in motion a greater quantity of productive labour and a greater portion of useful enterprise than could exist without it."[1]

The orthodox position, for example, Rosentein-Rodan (1961)[2] and Chenery and Strout (1966)[3], see FCI as a supplement to local capital resources. According to them, all capital inflows constitute net additions to LDC's productive resources, thus increasing its growth rate. The effect of FCI on growth can be seen through the well-known Harrod-Domar model which is:

$$g = sn$$

where: g = output growth rate i.e. $\Delta Y/Y$,

s= saving rate i.e. S/Y, which in a closed economy, at equilibrium, is equal to the investment rate, I/Y,

n= capital output ratio, i.e. the multiplier which relates the investment rate to growth.

Given an investment rate, which is equal to the saving rate and capital output ratio, the resultant growth rate can be determined. If the existing savings rate is insufficient to meet the desired growth rate, the domestic savings-investment gap can be bridged with foreign capital inflows.

This orthodox view of the contribution of FCI to growth can be expressed as follows:

$$g = n(s + FCI/Y)$$

where: $s = S/Y$ is the domestic savings rate,

FCI/Y = foreign capital inflows as a proportion of output.

In the above formula, FCI augments domestic savings and increases the investment rate which accelerates economic growth.

FCI can also lead the LDCs to eventual self-sustained growth. Higher investment rates achieved with foreign capital supplements would increase the domestic savings rate. Eventually, the higher domestic savings rate should be the main source of funds for investment activities without needing any further inflows of foreign capital.

Thus, Mc Kinnon (1964) wrote: "Aid or private investment is likely to be offered on the assumption that a higher growth rate in the receiving country will eventually become self-sustaining, i e., domestic savings and export capabilities will rise to the point where foreign capital transfers become unnecessary for this growth rate to be maintained." [4]

Most LDCs do not have adequate capital goods to meet the desired investment level. In addition, there are limited substitution possibilities between imported and domestic inputs. The required inputs have to be imported by financing with foreign exchange.

Based on the "two-gap" model developed by Hollis Chenery and his associates, FCI makes up for any foreign exchange shortages by bringing in foreign exchange to pay for the necessary imports of capital and intermediate goods.

FCI , particularly foreign direct investment (FDI) may be accompanied by technical assistance and expertise, scarce managerial skills, marketing know-how and international market linkages, and the creation of new export opportunities.

This orthodox position has been challenged by radical economists like Griffin and Enos (1970)[5] and Weisskoff (1972)[6], among others, who take the view that FCI is a substitute and not a complement to domestic capital resources. They argue that FCI has exercised a depressing effect on the savings propensities of developing countries, thus leading to a reduction of the domestic saving rates and lower rates of capital formation, and consequently, lower rates of growth.

2.2 Past Empirical Evidence

Most of the empirical testing of the contribution of FCI to growth has been carried out using a production function type growth equation. Using a Cobb-Douglas type production function, total output produced is a function of the resources used, namely labour, capital and technology, expressed as follows:

$$Y = T K^{\alpha} L^{\beta}$$

where: Y is the real output at time t,

T is an index of technology,

K is an index of capital stock

L is an index of the labour input,

α is the partial elasticity of output with respect to capital,

β is the partial elasticity of output with respect to labour.

The growth rate of output can therefore be classified as a function of the investment rate, the rate of labour force growth and technology, which can be written as follows:

$$\text{Growth} = a + b\, I/Y + c\, \Delta L/L$$

where: I/Y = the investment rate proxies by the increments in the capital stock,

$\Delta L/L$ = is the rate of growth of the labour force,

a = is the rate of "technological change",

b = is the partial elasticity of output with respect to increments in the capital stocks,

c = is the partial elasticity of output with respect to increases in labour input.

The I/Y in the equation is made-up by the domestic savings rate (S/Y) and FCI (FCI/Y), expressed as

$$I/Y = S/Y + FCI/Y$$

Thus, the effects of FCI on growth can be tested by substituting S/Y and FCI/Y for I/Y in the production function derived equation.

$$\text{Growth} = a + b_1 S/Y + b_2 FCI/Y + c \Delta L/L$$

Studies by Cohen (1968), Papanek (1973), and Stoneman (1976), all using cross sectional data from the 1950s and the early 1960s, show that growth in developing countries is positively and significantly related to both domestic savings and foreign capital inflows Ghazali Atan (1990) found evidence of a positive contribution of FCI to growth in his studies on the direct contributions of FCI to the Malaysian economy in the period between 1960 and 1986 Evidence from various past studies is shown in Table 2 1

2.3 Empirical Evaluation of the Contribution of FCI to Malaysian Economic Growth, 1966-96

2.3.1 Methodology and Hypotheses to be Tested

The growth rate of a country is a function of the investment rate, the rate of growth of the labour force, technology, the rate of structural change and other variables. This study, using the semi -log specification growth equation, relates output growth to the investment rate, labour force growth rate, and manufacturing growth rate as a proxy for structural change in the Malaysian economy between the years 1966 and 1996. The regression model here regresses the dependent variable, which is the output growth rate, against the explanatory or independent variables, namely technological change, investment rate, labour force growth rate and structural change rate. All explanatory variables are expected to carry positive signs and to be significant, which would then suggest that the output growth rate is dependent on the investment rate, labour force growth rate, manufacturing growth rate and technological change

The semi-log specification is as follows:

$$\ln y = a + b\, I/Y + c\, \Delta L/L + d\, SC$$

where: $\ln y$ = real GDP growth,

I/Y = is the investment rate i.e. gross capital formation as a proportion of GDP,

$\Delta L/L$ = is the growth rate of the actual numbers employed proxies for the rate of labour force growth,

SC = is the manufacturing value added as a proportion of GDP proxies for the structural change,

a = the rate of "technological change",

b = partial elasticity of output with respect to increments in the capital stock,

c = partial elasticity of output with respect to labour force growth rate,

d = partial elasticity of output with respect to manufacturing value added growth rate

To test the contribution of foreign capital to the Malaysian economic growth rate, the investment rate variables, I/Y was substituted by its constituents, S/Y and FCI/Y. Thus, the growth equation will be as follows

$$\ln y = a + b_1 \, S/Y + b_2 \, FCI/Y + c \, \Delta L/L + d \, SC$$

where b_1 = partial elasticity of output with respect to domestic savings rate,

b_2 = partial elasticity of output with respect to inflows of foreign capital.

Again, b_1 and b_2 are expected to carry positive signs and must be statistically significant.

2.3.2 Notes on the Data

The statistical analysis in this study was performed by using data from 1966 to 1996. The real GDP series was created by using the real rates of growth Data on the investment rate, structural change proxied by the manufacturing value added growth rate , domestic savings rate and FCI growth were scaled against GDP to avoid the heteroscedasticity problem. However, the investment rate and FCI growth rate took the lagged variables of one year with the expectation that investment and FCI would not spontaneously take effect. Any investment made whether financed by domestic funds or foreign capital will only accelerate growth after a year period. Thus, the investment growth rate is I/Y = I/Y - I/Y (t-1) and FCI/Y = FCI/Y - FCI/Y (t-1). Finally, the size of labour force employed series was created by using the labour force growth rate

2.3.3 Empirical Evaluation Results

Using ordinary least squares (OLS) method, this specification produced the following result

$$\ln y = 1.16 + 0.023\ I/Y + 0.021\ \Delta L/L + 0.056\ SC$$

$$(8.72)\quad (4.07)\qquad (0.70)\qquad (9.11)$$

$$R^2 = 95.6\% \qquad D.W = 1.2215$$

This regression result shows that each one per cent increase in the investment rate contributes to a 0.023 per cent increase in the growth rate, while each one per cent increase in the size of the labour force contributes to a 0.021 per cent increase in the growth rate and each one per cent increase of the manufacturing sector growth rate contributes to a 0.056 per cent increase in the growth rate.

All the explanatory variables carry the expected sign. At the one per cent level, the t value for b and d are significant except for the c rate which is significant only at 50 per cent level. The results thus supports the hypothesis that the investment rate and manufacturing growth rate have contributed positively to the Malaysian economic growth in the period covered. However, the labour force growth rate contributed less to economic growth compared to the investment rate and the manufacturing growth rate.

The specification was very satisfactory with $R^2 = 0.956$, which explained about 95.6% of the variation in the data. This means the data fits the model well.

To test the contribution of foreign capital to the Malaysian economic growth, the investment rate variable in the equation I/Y was substituted by its constituents, S/Y and FCI/Y. The result obtained is as follows:

$$\ln y = 0.98 + 0.024\ S/Y + 0.019\ FCI/Y + 0.010\ \Delta L/L + 0.056\ SC.$$

$$(6.65) \quad (3.76) \quad (2.57) \quad (0.36) \quad (9.12)$$

$$R^2 = 0.962 \qquad D.W = 1.8387$$

This result shows that each one per cent increase in the domestic savings rate contributes to a 0.024 per cent increase in the growth rate and each one per cent increase in the inflow of foreign capital contributes to a 0.019 per cent increase in the growth rate. Relatively, the domestic savings rate contributed higher and more significantly than foreign capital to the Malaysian economic growth rate.

2.4 Conclusion

Using the single equation approach, this study found that the Malaysian economic growth rate is a function of capital, labour and structural change. Any increase in the rate of these variables will accelerate the growth rate The analysis also supports the "orthodox position" that FCI complements and not substitutes for domestic capital to finance investment. All FCI augments domestic capital and will thus increase the national income through the multiplier effect.

However, the contribution of the domestic savings rate was found to be superior to FCI, both in terms of the size of the coefficient as well as statistical significance. The analysis result clearly indicates that domestically financed investment is more efficient and more versatile than foreign capital.

Notes:

[1] Quoted in Sidney E. Rolfe and Walter Damm, eds, The Multinational Corporation in the World Economy (New York: Praeger Publishers, 1970), p 121

[2] Rosenstein-Rodan, P.N.: " International Aid for Underdeveloped Countries", Review of Economics and Statistics 43 (1961), p. 107-38

[3] Chenery, H B. and Strout, A.: " Foreign Assistance and Economic Development", American Economic Review (Sept 1966).

[4] Mc Kinnon, R I. (1964) op. cit., p. 396.

[5] Griffin, K B and Enos, J L.: " Foreign Assistance : Objectives and Consequences", Economic Development and Cultural Change 18 (1970), p. 313-27

[6] Weisskoff, T E.: An Econometric Test of Alternative Constraints on the Growth of Underdeveloped Countries", Review of Economics and Statistics 54, No 1, Part II (1972), p. 67-78.

TABLE 2.1 Past Findings Equation Showing Positive Effects of FCI to Economic Growth Rate (t statistics given in brackets)

1 Cohen (1968):

a 27 LDCs, cross- section (1955-60) :

Growth = 0.194 + 0.621 $\Delta X/Y$ + 0.130 F/Y

(9.27) (4.69) (5.37)

R^2 = 0.627

b 41 LDCs, cross-section (1960-65)

Growth = 0.243 + 0.215 $\Delta X/Y$ + 0.101 F/Y

(8.77) (2.15) (3.47)

R^2 = 0.250

2 Ghazali Atan (1960-86):

a ln Y = 4.12 + 0.0399 I/Y + 0.022 $\Delta L/L$ + 0.0713RT

(3.63) (5.00) (1.95) (4.19)

R^2 = 88.2%

b. ln Y = 3.48 + 0.04 S/Y + 0.0212 FCI/Y + 0.033 $\Delta L/L$ + 0.0765 RT
(3.52) (5.28) (2.05) (3.31) (5.07)

R^2 = 89.5%

3. Stoneman (1976), cross-section, 1960s:

Growth = 1.088 + 0.252 S/Y + 0.318 AID/Y + 0.076 Pte FCI/Y - 0.029 FCI stock/Y

(2.29) (9.27) (8.57) (1.37) (-3.41)

R^2 = 0.369

Notes on variable name:

Growth	=	annual rate of increase in GDP, i.e. $\Delta Y/Y$,
S/Y	=	domestic savings rate as a proportion of GDP,
F	=	foreign capital inflows of all kinds,
Aid	=	net transfers received by governments plus official long-term borrowing,
X/Y	=	exports as a proportion of GDP, i.e. the 'export rate',
Δ L/L	=	labour force growth rate,
I/Y	=	investment rate as a proportion of GDP,
RT	=	resource transfer proxy namely the value of the non-agricultural sector as a proportion of total GDP,
FCI/Y	=	foreign capital inflows as a proportion of GDP.

Table 2.2

Regression Results: Effect of Investment Components on the Malaysian Economic Growth Rate, 1966-96 (Explained Variable: ln y)

Regr.	c	I/Y	S/Y	FCI/Y	SC	Δ L/L	R^2	D.W.
1.	1.16	0.023			0.056	0.021	95.6%	1.2215
t value =	(8.72)	(4.07)			(9.11)	(0.70)		
2.	0.98		0.024	0.019	0.056	0.010	96.2%	1.8387
t value =	(6.65)		(3.76)	(2.57)	(0.36)	(9.12)		

Notes on variable names:

ln y = log real GDP growth,
I/Y = investment rate as a proportion of GDP,
S/Y = domestic savings rate as a proportion of GDP,
FCI = foreign capital inflows as a proportion of GDP,
SC = manufacturing sector growth rate,
Δ L/L = labour force growth rate.

Table 2.3 Malaysia: Gross Domestic Product (GDP) at Market Price, Real GDP and Real GDP Growth Rate, 1966-96

Year	GDP (billion)	Real GDP (billion)	Real GDP Growth Rate (Per cent)
1966	7.9	7.3	6.4
1967	9.8	7.5	5.8
1968	10.2	8.1	8.4
1969	11.3	8.8	9.0
1970	12.5	9.3	6.3
1971	13.0	10.0	6.2
1972	14.2	10.7	6.8
1973	18.6	11.9	6.5
1974	22.9	12.8	8.3
1975	22.3	13.2	0.8
1976	28.1	14.3	11.6
1977	32.3	15.3	7.6
1978	36.3	16.4	7.5
1979	44.3	17.8	8.5
1980	51.4	19.2	8.0
1981	55.8	20.4	6.9
1982	62.6	21.6	5.6
1983	69.9	22.9	6.3
1984	80.0	24.7	7.6
1985	77.5	24.4	-1.1
1986	71.7	24.7	1.2
1987	79.7	26.0	5.4
1988	90.8	28.3	8.9
1989	102.6	30.9	9.2
1990	115.8	34.0	9.8
1991	132.4	36.9	8.6
1992	148.5	39.8	7.8
1993	165.2	43.1	8.3
1994	190.1	47.0	9.2
1995	218.7	51.5	9.5
1996	249.9	55.9	8.6

Source: Ministry of Finance, Economic Report, various issues

Table 2.4 Malaysia: Gross Investment and Gross Domestic Savings as Proportion of GDP, 1966-96

Year	Gross Investment	Gross Domestic Savings
1966	15.5	17.9
1967	16.4	19.1
1968	16.3	20.2
1969	13.9	24.5
1970	19.7	24.2
1971	20.7	22.2
1972	21.5	20.2
1973	22.5	28.2
1974	28.5	28.7
1975	23.3	23.8
1976	21.8	32.3
1977	23.5	31.4
1978	25.4	30.4
1979	24.2	34.3
1980	28.6	31.6
1981	32.9	25.3
1982	37.2	28.6
1983	35.9	31.2
1984	33.4	35.9
1985	27.6	32.6
1986	25.9	32.2
1987	23.2	37.4
1988	26.0	36.2
1989	29.3	34.6
1990	31.3	38.7
1991	37.2	44.4
1992	35.1	36.4
1993	37.8	37.7
1994	40.4	38.8
1995	43.5	39.5
1996	41.6	42.6

Source: Ministry of Finance, Economic Report, various issues

Notes:

1. Gross Investment = Gross fixed capital formation + changes in stocks

2. Gross domestic savings = Gross domestic product - consumption at market price

Table 2.5 Malaysia: Manufacturing Value Added to Total GDP and Labour Force Growth Rate, 1966-96

Year	Manufacturing Value Added	Labour Force Growth Rate
1966	11.0	2.7
1967	11.0	2.7
1968	11.0	2.7
1969	10.0	2.7
1970	13.1	2.7
1971	6.4	3.0
1972	15.0	3.0
1973	15.0	5.0
1974	16.0	3.0
1975	14.4	3.9
1976	15.1	3.5
1977	15.8	3.4
1978	19.1	6.3
1979	19.7	3.5
1980	20.3	3.6
1981	23.3	3.9
1982	20.2	2.4
1983	19.5	3.4
1984	18.4	2.7
1985	19.7	1.4
1986	20.9	1.5
1987	22.5	2.5
1988	24.4	3.5
1989	25.5	3.4
1990	26.9	4.3
1991	28.2	3.5
1992	28.8	2.9
1993	30.1	4.2
1994	31.6	3.0
1995	33.1	3.9
1996	34.5	3.1

Source: Ministry of Finance, Economic Report, various issues

Appendix 2.1 Regression Results: Effect of Investment on the Malaysian Economic Growth Rate, 1966-96

LS // Dependent Variable is Y22
Date: 07/26/98 Time: 23:02
Sample: 1967 1996
Included observations: 30
Excluded observations: 0 after adjusting endpoints

Variable	Coefficient	Std. Error	T-Statistic	Prob.
C	1.161029	0.133114	8.722095	0.0000
X12	0.022929	0.005626	4.075817	0.0004
X23	0.021142	0.029933	0.706295	0.4863
X3	0.056521	0.006205	9.108680	0.0000

R-squared	0.955759	Mean dependent var	3.002220
Adjusted R-squared	0.950654	S.D. dependent var	0.579024
S.E. of regression	0.128623	Akaike info criterion	-3.978166
Sum squared resid	0.430144	Schwartz criterion	-3.791339
Log likelihood	21.10433	F-statistic	187.2307
Durbin-Watson stat	1.221560	Prob(F-statistic)	0.000000

ppendix 2.2 Regression Results: Effects of FCI on the Malaysian Economic Growth ate, 1966-96

LS // Dependent Variable is Y22
Date: 07/26/98 Time: 23:04
Sample: 1967 1996
Included observations: 30
Excluded observations: 0 after adjusting endpoints

Variable	Coefficient	Std. Error	T-Statistic	Prob.
C	0.975920	0.146800	6.647969	0.0000
X23	0.010492	0.029174	0.359620	0.7222
X3	0.055615	0.006099	9.119343	0.0000
X4	0.024272	0.006461	3.756617	0.0009
X55	0.019023	0.007427	2.561197	0.0168

R-squared	0.962357	Mean dependent var	3.002220
Adjusted R-squared	0.956334	S.D. dependent var	0.573024
S.E. of regression	0.120995	Akaike info criterion	-4.072996
Sum squared resid	0.365996	Schwartz criterion	-3.839463
Log likelihood	23.52679	F-statistic	159.7828
Durbin-Watson stat	1.838747	Prob(F-statistic)	0.000000