CHAPTER 3

DETERMINANTS OF FDI IN ASEAN

The purpose of this part is to identify and estimate the factors that determine the inward flow of foreign direct investment (FDI) in ASEAN. The first section regards the characteristic of FDI in ASEAN. The second section regards methodology. The third section regards empirical results. The fourth section regards the comparision of determinants of FDI in each ASEAN countries.

3.1 The characteristic of FDI in ASEAN

This part emphasizes to present the overview of FDI in ASEAN by employing the graphs with regard to the past three decade data, the diagram will shows the growth rate of FDI in each ASEAN countries.

Growth in Indonesia has been strong in last two years, exceeding 7 per cent in 1995, as a result of rapid growth in both the industrial and services sectors. FDI in Indonesia during 1975 to 1996, the growth in FDI between 1975 and 1988 lied on 500 million of U$ dollars especially, in 1981, facing with the lowest FDI in Indonesia because falling oil price have been beneficial to most Asian LDCs-exceptions are Indonesia. The sharp declines in oil price of the mid-1980s reduced import costs and stimulate growth in the NICs(New

industrial countries), no oil ASEAN countries, and South Asia. Indonesia will have to reduce reliance on oil as a source of foreign exchange and government revenues, hence foreign direct investment in Indonesia decreased. (See diagram 3.1).

The Malaysian economy continued to grow rapidly in 1995, maintaining the economic momentum of recent years. A congenial policy environment, comparatively good infrastructure, and an enviable resource base have ensured that Malaysia has remained an attractive destination for foreign investors. FDI in Malaysia during 1975 to 1996, the growth rate gradually increase between 1975 and 1982 and decrease slowly between 1983-1987. Between 1989 to 1992, the FDI in Malaysia growed rapidly and slow down during 1993 to 1996. (See diagram 3.2).

In 1980, FDI in Philippines faced with the minus growth rate because the Philippines suffered from political instability in the early 1980s and, as a result, foreign manufacturers chose other FDI destinations. Later, in 1987, setting new election, modifying the FDI policy and growth of economic expansion result in highly expanding of FDI in Philippines. The recovery of the Philippines economy, which began in 1993, strengthened further in 1995. Political stability, prudent macro-economic management, and structural reforms, all of

which have helped to improve private sector confindence and the easing of some infrastrural constraints, especially power, has spurred domestic private sector investment, enhanced investor confidence in the government's economic management capability, and laid the basis for strong growth in 1995. (See diagram 3.3).

FDI in Singapore has risen steadily because Singapore has long been an economy open to foreign capital with relatively large manufacturing and finance sectors. Regarding this available advantage, Singapore is the most density of FDI in ASEAN. In 1989, the growth rate of FDI in Singapore was as twice extentive as its growth in 1988 and increased in later years. (See diagram 3.4). Singapore maintained a solid performance in 1995 following double-digit growth in 1994. Most observers and government officials alike are surprised by the rapid growth of the economy in the past two years.

In Thailand during 1975 to 1996, between 1975 to 1987 the growth rate rised gradually but it mounted to four times in 1988 after the result that government declared Board of Investment (BOI) for investment supporting in 1977 and increased continuously later. Assumably, however, the political instability caused the slowdown of FDI in Thailand in 1994. (See diagram 3.5). Led by strong export

growth and expanding private consumption and investment, Thailand grew by 8.6 per cent in 1995, surpassing the already high level of 8.3 per cent achieved in 1993. Industry performed very well as the sector grew at almost 12 per cent. Agriculture grew more slowly but was able to sustain the historical average growth of about 3 per cent. The services sector expanded by 7 per cent as financial services developed further, despite a weak market in the latter half of the year. Tourist arrivals also grew at a steady pace. Domestic demand conditions played a major role in generating growth. Farm income rose as a result of a combination of firm primary product prices and increased productivity; while further increases in the minimum wage and the continued boom in manufacturing boosted consumption in urban areas. The sharp rise in investment applications submitted in 1994 was translated into new projects as the share of investment in gross domestic investment continued to grow. Increased incomes, the development of a range of new savings instruments, and a more competitive banking sector resulted in a higher level of domestic saving. The labour market was tight as unemployment remained at slightly above 3 per cent. Shortages of skilled labour continued to put pressure on labour costs.

Diagram 3.1-3.5 show the foreign direct investment in the ASEAN economies foreign direct investment from the end of 1975s to 1996 in Malaysia, Singapore and Thailand has risen steadily, except for Indonesia and the Philippines.
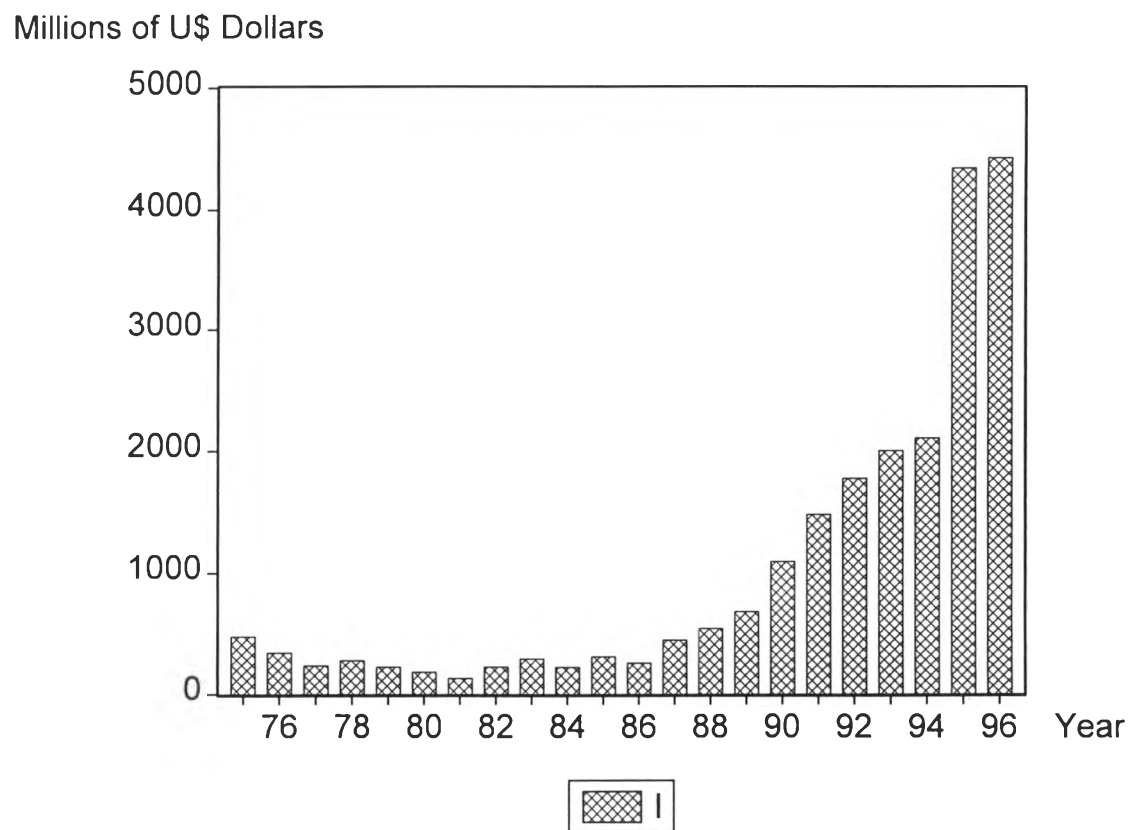
Diagram 3.1 FDI in Indonesia

Millions of U$ Dollars

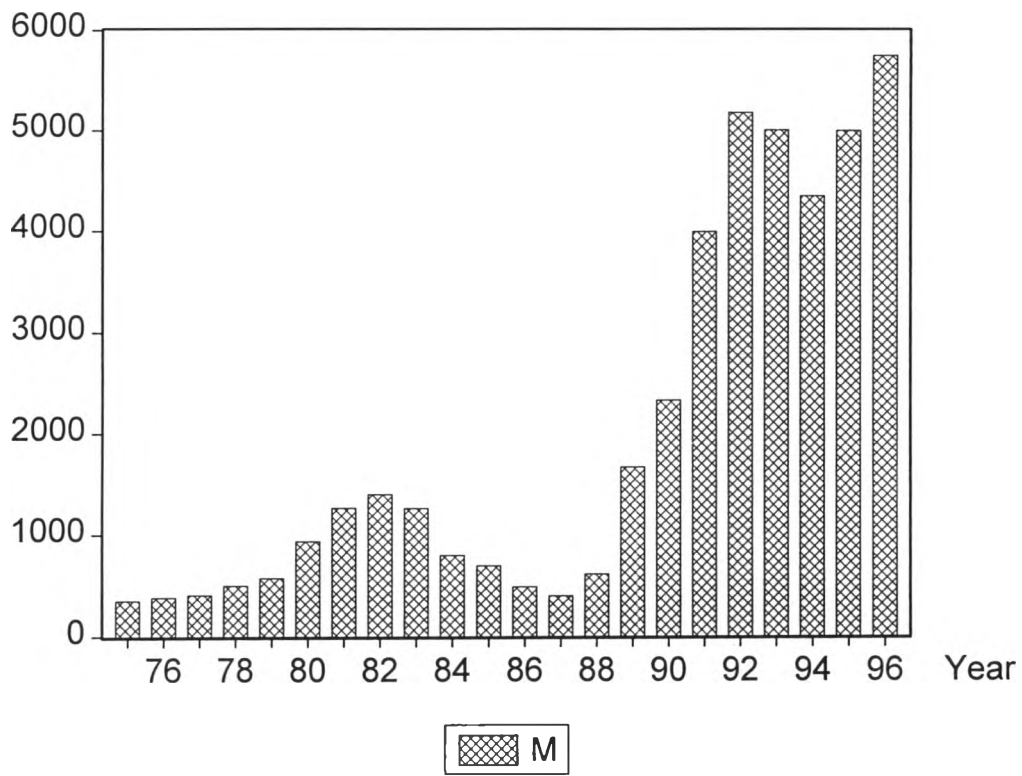# Diagram 3.2 FDI in Malaysia

Millions of U$ Dollars

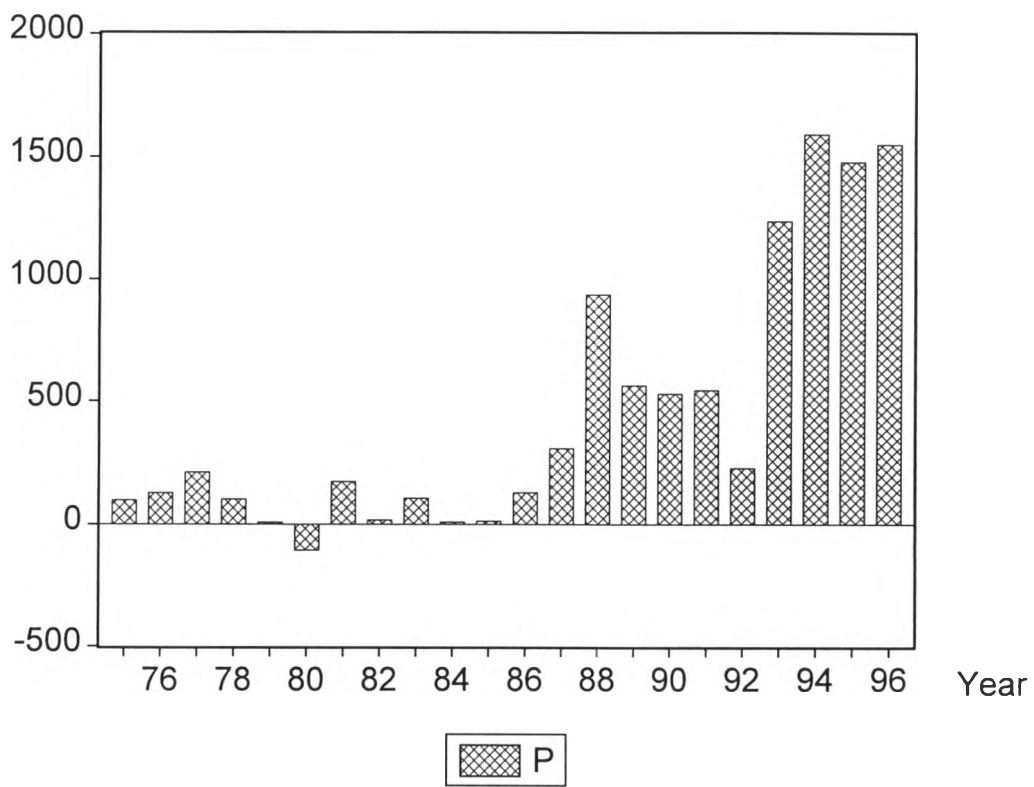# Diagram 3.3 FDI in Philippines

Millions of U$ Dollars

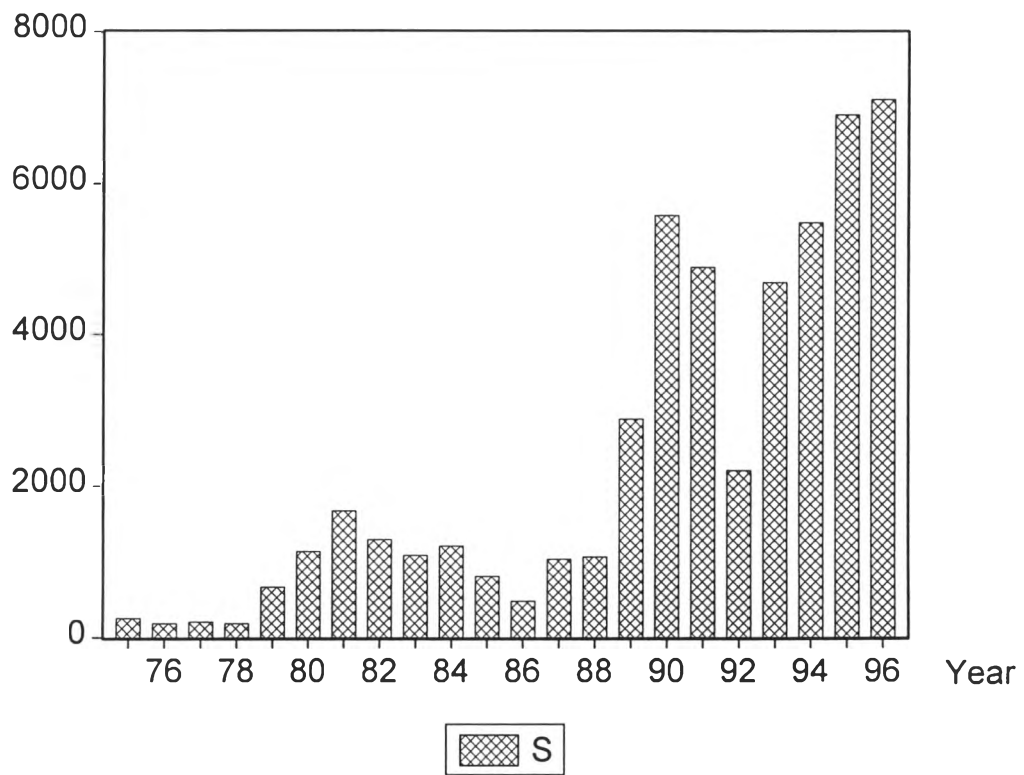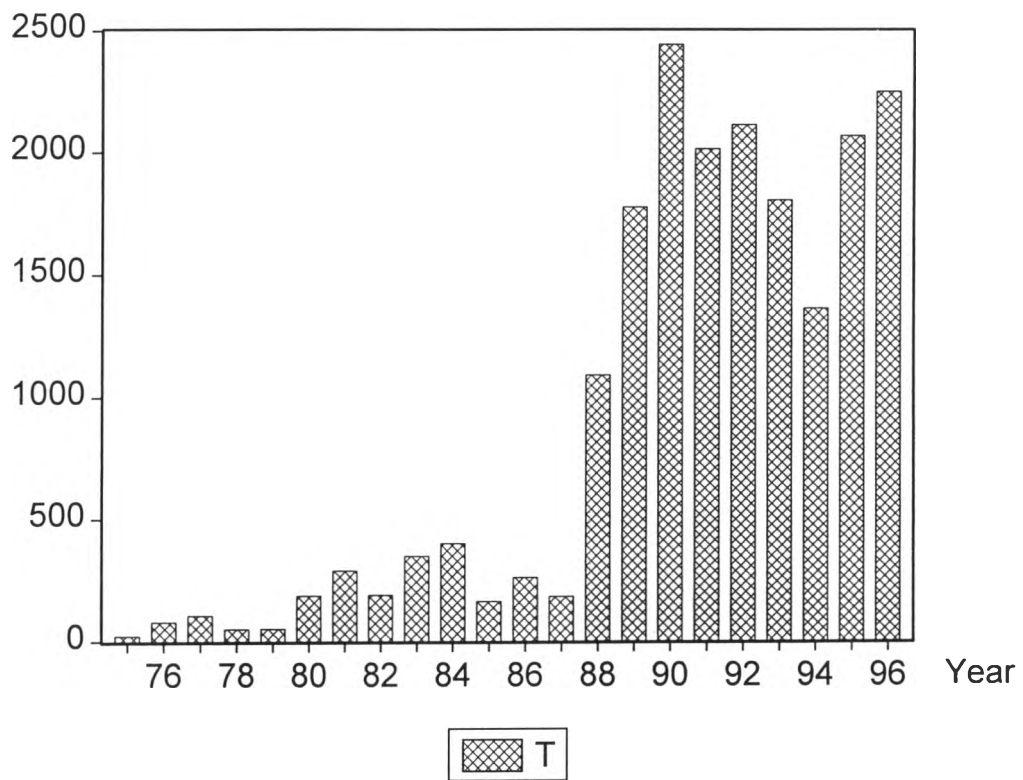# Diagram 3.4 FDI in Singapore

Millions of U$ Dollars

Diagram 3.5 FDI in Thailand

Millions of U$ Dollars

3.2 Methodology

This part focuses on methodololy of the study. The discussion is organized into three main sections. The first section regards setting up the determinants in equation i.e. GNP, change in GNP, domestic investment, exchange rate, the variation of exchange rate, degree of openness, government expenditure share, and labor cost. The second section regards the coefficient signs of variables. The third section regards the sources of data employed in this empirical study part.

3.2.1 The Model

The analysis of determinants of FDI can be discussed through OLS and application of pooled time series/cross-section empirical methods, eight factors are estimated.

A. Multiple Regression

The equation used for each of the countries is as follows:

$$FDI_t = \alpha_0 + \alpha_1 GNP_{t-1} + \alpha_2 \Delta GNP_t + \alpha_3 (I/GNP)_{t-1} + \alpha_4 XR_t$$

$$+ \alpha_5 V(XR)_t + \alpha_6 ((X+M)/GDP)_{t-1} + \alpha_7 (GovExp/GDP)_t$$

$$+ \alpha_8 W_t + U_t$$

where:

FDI_t　　　　　　= inflow of FDI to each countries in year t

GNP_{t-1}　　　　= the level of GNP in year t-1

ΔGNP_t = the change in GNP between year t-1 and t

$(\text{I/GNP})_t$ = the ratio of domestic investment to GNP in

year t-1

XR_t = the exchange rate at year t

$V(\text{XR})_t$ = the squared deviation of the exchange rate

from its mean over the period 1975-1996

$((\text{M+X})/\text{GDP})_{t-1}$ = the ratio's sum of total import and export

to GDP in year t-1 (Openness to FDI and trade)

$(\text{GovExp/GDP})_t$ = the ratio of government expenditure share

to GDP at year t

W_t = the labour cost at year t

U_t = the error term

B. Pooled Regression

According to examine the determinants of FDI in ASEAN countries, there are 5 countries i.e. Indonesia, Malaysia, Philippines, Singapore, and Thailand, so a pooled regression is brought to be the another empirical method for this study. A pooled regression which is time series and cross-sectional observations are combined or pooled together. Vinod and Ullah said that when dealing with cross-section and time series data, where each individual cross-section sample is

small so that sharp inference about the coefficients are not possible, it is a common practice in applied work to pool all data together, and estimate a common regression. The basic motivation for pooling time series and cross-section data is that if the model is properly specifield, pooling provides more efficient estimation, inference, and possibly prediction. This equation uses for pooled regression (cross-sectional and annual time series data), and is estimated by using OLS.

$$FDI_{it} = \alpha_0 + \alpha_1 GNP_{it-1} + \alpha_2 \Delta GNP_{it} + \alpha_3 (I/GNP)_{it-1} + \alpha_4 XR_{it}$$

$$+ \alpha_5 V(XR)_{it} \alpha_6 ((X+M)/GDP)_{it-1} + \alpha_7 (GovExp/GDP)_{it}$$

$$+ \alpha_8 W_{it} + U_{it}$$

where:

FDI_{it} = inflow of FDI to ASEAN in year t

GNP_{it-1} = the level of GNP in year t-1

ΔGNP_{it} = the change in GNP between year t-1 and t

$(I/GNP)_t$ = the ratio of domestic investment to GNP in

year t-1

XR_t = the exchange rate at year t

$V(XR)_t$ = the squared deviation of the exchange rate from

its mean over the period 1975-1996

$((M+X)/GDP)_{it-1}$ = the ratio's sum of total import and export to GDP

in year t-1 (Openness to FDI and trade)

$(\text{GovExp/GDP})_{it}$ = the ratio of government expenditure share to GDP

at year t

W_{it} = the labour cost at year t

U_{it} = the error term

3.2.2 The Coefficient Sign

With regard to "Explaining and Forecasting Regional Flows of Foreign Direct Investment" the United Nations report (New York, 1993), the determinants of FDI are as follows: GNP_{t-1}, ΔGNP_t, $(I/\text{GNP})_{t-1}$, XR_t, $V(\text{XR})_t$, $((X+M)/\text{GDP})_{t-1}$, $(\text{GovExp/GDP})_t$, and W_t. The expected signs of these determinants are as follows:

$$+ \quad\quad + \quad\quad + \quad\quad - \quad\quad - \quad\quad +$$

$\text{FDI}_t = f\,\{\ \text{GNP}_{t-1}\ ,\ \Delta\text{GNP}_t,\ (I/\text{GNP})_{t-1}\ ,\ \text{XR}_t,\ V(\text{XR})_t,\ ((X+M)/\text{GDP})_{t-1},$

$$+ \quad\quad\quad -$$

$(\text{GovExp/GDP})_t,\ W_t\ \}$

1. $\textbf{GNP}_{t-1}$ should have **positive impact** on FDI because the size of the market is represented by the size of GNP of the region or country ; a large and growing market provides opportunities for investment

both from domestic sources and foreign TNCs. A number of studies have suggested that a large economy provides opportunities for exploiting economies of scale embedded in large markets, superior infrastructure capital to support new business activities and substantial sources of complementary capital for FDI to flourish. The likelihood of advances in technology, a high degree of skilled labour and efficient organizational capital are also associated with economies of large markets.

2. Δ **GNP$_t$** should have **positive impact** on FDI because the change in GNP serves as a cyclical factor to capture fluctuations in output of the economies of a paticular region. These fluctuations are generated by complex supply and demand shocks that affect an economy or a region. For example, the oil shocks in the early and late 1970s, and the subsequent balance-of-payment difficulties and rapid inflation led to fluctuation in aggregate output in the late 1970s and in the early 1980s. It is reasonable to assume that FDI inflows are positively correlated with changes in output. A region experiencing a stable or accelerating growth of output is likely to be more attractive to TNCs than one experiencing wide fluctuations in GNP.

3. **(I/GNP)$_{t-1}$** should have **positive impact** on FDI because this variable could play an important role in attracting FDI from abroad is

the rate of domestic capital formation. The hypothesis is that economies or regions that invest a high proportion of their GNP in plant and equipment are likely to be attractive markets for foreign investors seeking to increase their participation through the acquisition of existing firms or the establishment of greenfield operations. There should be a complementary relationship between FDI inflows and the rate of domestic investment as a proportion of GNP.

4. **XR_t** should have **negative impact** on FDI because this type of liquidity-based model explaining the effect of exchange-rate changes on FDI inflows rests on changes in the value of the host country's currency, and may reflect possible misalignments of currencies. However, there is an additional role for the exchange rate. Exchange rate volatility may impede FDI because, to a certain extent, it increases uncertainty, thus decreasing a firm's willingness to undertake long-term commitments to expand capacity. Firms enter a foreign market only after the path of exchange rates is suitably stable so as to assure a reasonable level of profit. Volatility of the exchange rate may therefore serve to inhibit FDI.

5. **$V(XR)_t$** should have **negative impact** on FDI because this novel variable of the model is the effect of exchange rate fluctuations on

FDI inflows. Some literature exists on the relationship between FDI and exchange-rate movements. The response of FDI to exchange-rate movements may take numerous forms. Firms may expand or contract existing production operations, enter or exit foreign markets, change the location of their facilities, reinvest or repatriate earning or consolidate markets, power through mergers and acquisition. As mentioned earlier, Froot and Stein (1991) provided a simple theoretical model and some preliminary empirical estimates that suggest a role for exchange rates in explaining FDI inflows to the United States. The basic idea is that, if domestic firms are cash constrained, a depreciation of the host country currency will give foreign enterprises the ability to outbid domestic firms because of the increase in the real value of foreign firm's capital that has been brought about as a result of the depreciation. Froot and Stein found a negative relationship between FDI inflows and exchange rate change ; for example, a one per cent change in the exchange rate leads to about a .07 per cent change in FDI inflows. This negative relationship is also found at the industry level. The coefficient of the trend variable is positive and statistically significant, implying that, although exchange rate depreciation leads to higher FDI inflows to the United

States, the upward trend in the share of assets owned by foreigners (the value of which tripled over the last decade) remains unexplained.

6. $((X+M)/GDP)_{t-1}$ should have **positive impact** on FDI because this variable that may be of importance for FDI inflows is the degree of openness of an economy, measured by the sum of exports and imports as a per cent of GNP. Inflows of FDI should be positively related to the degree of openness of an economy or region.

7. $(GovExp/GDP)_t$ should have **positive impact** on FDI because stronger government expenditure will support foreign investors in infrastructure development. The government expenditure is classified according to economic classification, current and capital expenditure reflecting consumption and investment spending respectively. Therefore the decline in the government expenditure which results in the inadequate infrastructure would create bottlenecks for growth.

8. W_t should have **negative impact** on FDI because the higher labour cost will be the causation of changing in investment. In many industries labour is a major element of cost. The search for cheap labour has led to multinationals reorganising their operations so that the labour intensive stages can be relocated. Multinationals have gained from lower cost activities. Access to advanced countries' market is a major contribution of this type of investment for host

Third World countries who are usually denied market access and the contacts of the investing companies are major contribution to their export efforts.

For the exchange rate and the the squared deviation of the exchange rate, they can not be used in this study since the ASEAN countries use the fixed exchange rate during 1975 to 1996.

3.2.3 Sources of Data

The time series data employed in this study are obtained mainly from UN ESCAP, ILO, and World Bank Library, presented by the International Financial Statistics Year Book of the International Monetary Fund, UN Commodity Trade Statistics, and Asian Development Bank Year Book. The GNP is defined as GNP is divided by GDP deflator base on 1985. The net FDI inflow government expenditure share and labour cost are divided by GDP, but the domestic investment is divided by GNP.

In addition, the deviation the level of the exchange rate of V (XR) is measured as $(XR_t - \overline{XR})^2$, where $\overline{XR}$ is the mean of the exchange rate, defined as $\overline{XR} = \Sigma_1^T XR_t / T$. T is the number of year in the sample period. Besides, the degree of openness are trade weighted indices using as weights the ratio of exports plus import to GDP.

With reference to statistics of data in ASEAN (only Indonesia, Malaysia, Philippines, Singapore, and Thailand) during 1975-1996, a list of all data is shown in Appendix.

3.3 Empirical Results

This part focuses on the empirical results of the study. The discussion is organized into two main sections. The first section is devoted to the results of estimated equation in each ASEAN countries. The second section is devoted to the results of estimated equation for pooled countries.

3.3.1 Estimation Results in Each ASEAN Countries

The analysis of determinants of FDI can be made through OLS, and the results are brought to interpret as follows:

A. *Indonesia*

FDII   =   - 0.014659 - 0.036887 GNPI(-4) + 0.00731 OI

    Std.Error (0.007603)   (0.009004)   (0.003444)

    T-stat   (-1.928163)   (4.096526)   (2.122739)

Adjusted R^2 = 0.5131   S.E. of Regression = 0.004035

Durbin-Wstat = 1.80   F-statistic = 4.49

Sample Range: 1975-1996   T-critical = 2.101

The statistical outcome for Indonesia can be interpreted as follows: at 5 % level of significance, two variables which are the level of GNP and the degree of openness are statistically significant. This implies that these two variables are the factor that could determine the foreign direct investment in Indonesia. Inflow of FDI should be related to the level of GNP and the degree of openness of an economy or region are the important factors which are relevant to foreign direct investor's decision. Besides, the standard error of regression is quite far from mean because the figure is shown by 0.004035 or approximately 33.16 % of the mean for dependent variables (as expected, it should close to 10 % or 15 % of mean for dependent variables). Further, the adjusted R^2 of 0.513078 can be concluded that these 2 variables (the level of GNP, the degree of openness)help to explain 51.31 % of the foreign direct investment in Indonesia. If we ignore some variables which are the change in GNP, domestic investment, government expenditure, and labour cost to improve the result, it seems better. Only the the level of GNP is the lagged independent variable for 4 period because time is relevant to foreign Investor's decision. The government of Indonesia recognises that foreign investment is essential to the success of its plans for economic development. The government actively seeks foreign

investment and has opened over 300 business areas previously closed to foreign firms. Throughout 1988 and 1990, the government announced several deregulatory measures in an effort to compete with other ASEAN countries for foreign investment. The International Monetary Fund (IMF) study has acknowledged that countries with small internal markets, few natural resources, a relatively underdeveloped infrastructure and limited possibilities for manufactured exports may not be able to attract substantial direct investment even with liberal regulations and generous incentives. It should, however, be remembered that the large countries with rich natural resources also can not attract foreign investment if their policies are restrictive. As far as we consider F-test, the critical region is 4.49, which falls in the rejected area, so we reject H_O. It means that there should be at least one parameter from all parameters can explain a change of foreign direct investment. The extreme importance from the estimated regression is represented by the Durbin Watson d statistic which indicates the presence of indecision : concerning with observations and 2 explanatory variable, the 5 % Durbin-Watson Table shows that d_L = 1.046 and d_U = 1.535, the estimated d of 1.80 is no autocorrelation, then. The sign of coefficients for all variables which are statistically significant are

consistent with the theories. Finally, we may conclude that the level of GNP and the degree of openness have position impact on foreign direct investment in Indonesia. Then,the additional explanation of results will be explained in section (3.4). The trade liberalization was considered one of the major achievements of the Fourth Development Plan. These measures transformed the trade regime from one of import substitution to export promotion and served to stimulate exporters by permitting the duty free importation of inputs or equipment, either directly or by obtaining duty drawbacks.

B. *Malaysia*

FDIM $=$ -0.065747 $+0.158328$ GNPM(-2) $+0.19048$ GM

Std.Error   (0.032637)   (0.033794)   (0.08272)

T-stat   (-2.014479)   (4.685071)   (2.302698)

Adjusted R^2 = 0.5126   S.E. of Regression = 0.015273

Durbin-Wstat = 0.39   F-statistic = 4.41

Sample Range: 1975-1996   T-critical = 2.086

Turning next to Malaysia, at 5 % level of significance, only two variables which are the level of GNP and government expenditure are statistically significant. This implies that these two variables have impact to the foreign direct investment in Malaysia. Rather, the

standard error of regression is quite far from mean because the figure is shown by 0.015273 or approximately 33.82 % of the mean for dependent variables (as expected, it should close to 10 % or 15 % of mean for dependent variables). Next, the adjusted R^2 of 0.5126 can be concluded that these 2 variables (the level of GNP, and government expenditure share) help to explain 51.26 % of the foreign direct investment. If we ignore some variables as change in GNP, domestic investment, the degree of openness and labour cost, the result seems better, and the adjusted R^2 has been increased. Additionally, the level GNP is the lagged independent variable for 2 period since the foreign investors who have just started to invest in host countries require the time for management. A simple partial adjustment process can accelerate the speed of adjustment. As far as we consider F-test, the critical region is 4.41 which fall in the rejected area, we then reject H_O. It means that there should be at least one parameter from all parameters can explain a change of foreign direct investment in Malaysia.

The extreme importance from the estimated regression is the Durbin Watson d statistic which indicates the presence of indecision: concerning with 20 observations and 2 variables, the 5 % Durbin-Watson Table shows that $d_L = 1.1$ and $d_U = 1.537$, hence the estimated

d of 0.39 is is below the lower critical limit. Since the regression is plague by positive autocorrelation, we can not trust the standard error and T ratios.

To improve the results, we reestimated the FDI equation by using The Cochrane-Orcutt procedure estimated equation is:

$$AR(1) \; FDI_t = -0.09418 + 0.231104 \; GNPM(-2) + 0.157373 \; GM$$

Std.Error (0.046488)   (0.08222)   (0.056358)

T-stat   (-2.025917)   (2.810811)   (2.792389)

Adjusted R^2 = 0.8327   S.E. of Regression = 0.009089

Durbin-Wstat = 1.22   F-statistic = 4.45

Sample Range: 1975-1996   T-critical = 2.093

Finally, result interpretation will be concentrated on Malaysia, at 5% level of significance, only two variables which are the level of GNP and government expenditure are statistically significant. This implies that these two variables have impact to the foreign direct investment in Malaysia. A large and growing market provides opportunities for investment both from domestic sources and foreign TNCs, and the domestic investment could play an important role in attracting FDI from abroad. Malaysia welcomes foreign investment only in the manufacturing sector. Rather, the standard error of regression is near mean because the figure is shown by 0.009089 or

approximately 19.80 % of the mean for dependent variables (as expected, it should close to 10 % or 15 % of mean for dependent variables). Next, the adjusted R^2 of 0.8327 can be concluded that these 2 variables (the level of GNP, and government expenditure share) help to explain 83.27 % of the foreign direct investment. If we ignore some variables as change in GNP, domestic investment, the degree of openness and labour cost, the result seems better, and the adjusted R^2 has been increased. Additionally, the level GNP is the lagged independent variable for 2 period since the foreign investors who have just started to invest in host countries require the time for management. A simple partial adjustment process can accelerate the speed of adjustment. As far as we consider F-test, the critical region is 4.45 which fall in the rejected area, we then reject H_O. It means that there should be at least one parameter from all parameters can explain a change of foreign direct investment in Malaysia.

The extreme importance from the estimated regression is the Durbin Watson d statistic which indicates the presence of indecision: concerning with 19 observations and 2 variables, the 5 % Durbin-Watson Table shows that $d_L = 1.074$ and $d_U = 1.536$, hence the estimated d of 1.22 is indecision. The sign of coefficient for the level of GNP and the degree of openness which is statistically significant is

consistent with the theories. We may conclude that it has positive impact on foreign direct investment in Malaysia. Then,the additional explanation of results will be explained in section (3.4). The Malaysian economy continued to grow rapidly in 1995, maintaining the economic momentum of recent years. A congenial policy environment, comparatively good infrastructure, and an enviable resource base have ensured that Malaysia has remained an attractive destination for foreign investors.

C. *Philippines*

$$FDIP = -0.057201 + 0.176237 \text{ GNPP}(-4) + 0.449108 \text{ CGNPP}(-1)$$

   Std.Error   (0.01492)   (0.039606)   (0.111873)

    T-stat   (-3.833769)   (4.449804)   (4.014429)

Adjusted R^2 = 0.5719   S.E. of Regression = 0.007023

Durbin-Wstat = 2.08   F-statistic = 4.49

Sample Range: 1975-1996   T-critical = 2.101

Considering the determinants of FDI in Philippines, at 5 % level of significance, the level of GNP and the change in GNP are statistically significant. This implies that these 2 factors that could determine the foreign direct investment in Philippines. Inflow of FDI should be related to the degree of openness of an economy or region.

In Philippines, the business operations are governed by various laws and regulations. Moreover, standard error of the regression is quite far from mean because the result is shown by 0.007023 or approximately 64.82 % of the mean for dependent variables (as expected, it should close to 10 % or 15 % of the mean for dependent variables). Further, the adjusted R^2 of 0.5719 can be concluded that these 2 variables (the level of GNP, change in GNP) help to explain 57.19 % of the foreign direct investment in Philippines. Regardless of the degree of openness, domestic investment, government expenditure, and labour cost in the estimated regression, the result seemed better, the adjusted R^2 has been improved. The level of GNP and change in GNP are the lagged independent variable for 4 periods and 1 period since the foreign investors who have just started to invest in host countries require the time for management. A simple partial adjustment process can accelerate the speed of adjustment. Turnning to F-test, the critical region is 4.49 at 5 % level of significance, we reject H_O since it falls in the rejected area. It means that there should be at least one parameter from all parameters can explain a change of foreign direct investment in Philippines. The extreme importance from the presence of indecision : involving with 18 observations and 2 explanatory variables the 5 % Durbin-Watson Table shows that $d_L = 1.046$ and d_U

= 1.535, hence the estimated d of 2.08 is no autocorrelation. The sign of coefficient for the level of GNP and change in GNP which is statistically significant is consistent with the theories. We may conclude that it has positive impact on foreign direct investment in Philippines. Then,the additional explanation of results will be explained in section (3.4).

D. _Singapore_

FDIS   =   + 0.06438 + 0.033943 OS - 0.324046 WS(-1)

    Std.Error   (0.045207) (0.014089)   (0.059541)

    T-stat   (1.424117) (2.409137)   (-5.442414)

Adjusted R^2 = 0.6094   S.E. of Regression = 0.017638

Durbin-Wstat = 1.74   F-statistic = 4.35

Sample Range: 1975-1996   T-critical = 2.08

The statistical result for Singapore can be interpreted as follows: at 5 % level of significance, there are two variables which are the degree of openness and labour cost are statistically significant. This implies that these two variables are the factors which could determine the foreign direct investment in Singapore. The growing market is attractive the foreign investors, and the real interest rate is relevant to foreign investor's decision, and higher labour cost will be the causation of changing in investment. The government of

Singapore is strongly committed to a market economy based on the principle of free enterprise. Apart from public utilities and telecommunication, most economies activities are open to foreign investors. The government particularly encourages industrial projects requiring high technology or which are export oriented, and offers a number of incentives for investment in certain manufacturing and Pioneer industries. In particular, the country welcomes foreign investment in the areas which develop technological, management and labour skills consistent with the aims of the "Second industrial revolutio". In addition, the standard error of regression is quite far from mean as it is represented by 0.017638 or approximately 33.24 % of the mean for dependent variables (as expected, it should close to 10 % or 15 %). Besides, the adjusted R^2 of 0.6094 can be concluded that these 2 variables (the degree of openness, and labour cost) help to explain 60.94% of the foreign direct investment in Singapore. If we ignore some variables which are the level of GNP, the change in GNP, domestic investment, government expenditure to improve the result , it seems better and can increase the adjusted R^2. Only the labour cost is the lagged independent variable for 1 periods because the foreign investors who have just started to invest in host countries require the time for management. A simple partial adjustment process

can accelerate the speed of adjustment. As we consider F-test, the critical region is 4.35, so we reject H_O since it falls in the rejected area. It means that these should be at least one parameter in all parameters can explain a change of foreign direct investment. The extremed importance from the estimated regression is the Durbin Watson d statistic which indicates the presence of indecision : concerning with 21 observations and 2 explanatory variables, the 5 % Durbin-Watson Table shows $d_L = 1.125$ and $d_L = 1.538$, the estimated d of 1.74 is therefore no autocorrelation.

The sign of coefficients for all varialbles which are statistically significant are consistent with the theories. The level of GNP has positive impact on foreign direct investment, but the labour cost has negative impact on foreign direct investment. Then, the additional explanation of results will be explained in section (3.4). Singapore has long been an economy open to foreign capital with relatively large manufacturing and finance sectors. Regarding this available advantage, Singapore is the most density of FDI in ASEAN. Labour market pressures in Singapore remained high in 1995. As the flow of young entrants into the labour force slowed, immigrant labour continued to be needed in the construction sector and in lower-paid service jobs. The government budget for 1995 provided for an

increase in revenue of nearly 9 per cent, in line with overall income growth. Total expenditure rose faster at 21 per cent, with much of this growth reflecting a sharp increase of 46 per cent in infrastructure spending. As a result, the overall budget surplus fell to 5 per cent of GDP.

E. *Thailand*

FDIT = - 0.002017 + 0.085378 CGNPT + 0.016626 OT(-1)

Std.Error (0.006783) (0.05653) (0.017454)

T-stat (-0.297412) (1.510306) (0.952525)

Adjusted R^2 = 0.4838   S.E. of Regression = 0.005165

Durbin-Wstat = 0.61   F-statistic = 4.38

Sample Range: 1975-1996   T-critical = 2.08

The result interpretation will be concentrated on Thailand. At 5% level of significance, there is no variable that is statistically significant. The extreme importance from the estimated regression is the Durbin Watson d statistic which indicates the presence of indecision. Concerning with 21 observations and 2 explanatory variables, the 5 % Durbin-Watson Table shows d_L = 1.125 and d_U = 1.538, hence the estimated d of 0.61 is is below the lower critical limit. Since the regression is plague by positive autocorrelation, we can not trust the standard error and T ratios.

To improve the results, we reestimated the FDI equation by using The Cochrane-Orcutt procedure estimated equation is:

AR(1) FDI_t =   - 2.014643 + 0.121644 CGNPT + 0.054109 OT(-1)

Std.Error (448.8639)   (0.040495)   (0.023709)

T-stat   (-0.004488)   (3.003952)   (2.282171)

Adjusted R^2 = 0.7236   S.E. of Regression = 0.003824

Durbin-Wstat = 1.95   F-statistic = 4.41

Sample Range: 1975-1996   T-critical = 2.086

Finally, result interpretation will be concentrated on Thailand, at 5% level of significance, there are two variables which are the change in GNP and the degree of openness are statistically significant. This implies that these two variables are the factors that can determine the foreign direct investment in Thailand. The size of growing market provides opportunities for investment both from domestic sources and foreign TNCs, gross domestic investment also increased rapidly, led by private investment. The Thai economy is an open market-oriented economy. Over half of the country's gross national product is traded internationally. Government subsidy in the national economy is very low, representing less than two per cent of the national budget. The government has concentrated on the provision of infrastructure (such as communications, roads, dams, schools, and training and research

institutions) to facilitate the growth of the private sector. There has also been a substantial increase in the inflow of foreign direct investment. The standard error of regression is quite far from mean because the figure is shown by 0.003824 or approximately 33.25 % of the mean for dependent variables (as expected, it should close to 10 % or 15 %). Further, the adjusted R^2 of 0.7236 can be concluded that these 2 variables (the change in GNP and the degree of openness) help to explain 72.36 % of the foreign direct investment in Thailand. If we ignore some variables as expenditure share, and labour cost, the result seems better, improves the adjusted R^2. The degree of openness is the lagged independent variable for 1 periods because the foreign investors who have just started to invest in host countries require the time for management. A simple partial adjustment process can accelerate the speed of adjustment. As we consider F-test, the critical region is 4.41, so we reject H_O since it falls in the rejected area. It means that these should be at least one parameter in all parameters can explain a change of foreign direct investment. The extreme importance from the estimated regression is the Durbin Watson d statistic which indicates the presence of indecision. Concerning with 20 observations and 2 explanatory variables, the 5 % Durbin-Watson

Table shows d_L = 1.1 and d_U = 1.537, the estimated d of 1.96 , therefore, no autocorrelation.

The sign of coefficients for all varialbles which are statistically significant are consistent with the theories. The change in GNP and the degree of openness have positive impact on foreign direct investment. Then, the additional explanation of results will be explained in section (3.4). The Thai economy is well positioned to take advantage of the new global and regional trade arrangements. For the longer term, however, Thailand will need to hasten the process of structural change, placing greater emphasis on its production and export of high value-added products. This will call for considerable efforts, both to expand the supply of skilled labour and to make rapid improvements in physical infrastructure, especially in the areas of the country that have so far lagged behind.

3.3.2 Estimation Results in Pool ASEAN countries

The analysis of determinants of FDI can be made through OLS by using application of pooled time series/cross-section empirical methods, and the results are brought to interpret as follows:

$$FDI_{it} = + 0.008599 + 0.025663\ O_i - 0.089720\ W_i$$

Std.Error   (0.002809) (0.003129)   (0.0026238)

T-stat   (3.061046) (8.200434)   (-3.419496)

Adjusted R^2 = 0.4796   S.E. of Regression = 0.01814

Durbin-Wstat = 0.56   F-statistic = 2.75

Sample Range: 1975-1996   T-critical = 1.98

The result interpretation will be concentrated on ASEAN. At 5% level of significance, two variables which are the degree of openness and labour cost are statistically significant. This implies that these four variables are the factors that can determine the foreign direct investment in ASEAN countries. The standard error of regression is quite far from mean because the figure is shown by 0.01814 or approximately 65.05% of the mean for dependent variables (as expected, it should close to 10% or 15%). Further, the adjusted R^2 of 0.4796 can be concluded that these 2 variables (the degree of openness and labour cost) help to explain 47.96% of the foreign direct investment in Thailand. As we consider F-test, the critical region is 2.75, so we reject H_O since it falls in the rejected area. It means that these should be at least one parameter in all parameters can explain a change of foreign direct investment.

The extreme importance from the estimated regression is the Durbin Watson d statistic which indicates the presence of positive autocorrelation. Concerning with 110 observations and 2 explanatory variables, the 5 % Durbin-Watson Table shows d_L = 1.634 and d_U =

1.715, the estimated d of 0.56 is below the lower critical limit. Since the regression is plague by positive autocorrelation, we can not trust the standard error and T ratios.

To improve the results, we reestimated the FDI equation by using The Cochrane-Orcutt procedure estimated equation is:

AR(1) FDI_{it} = $0.006834 + 0.029054\ O_i - 0.128992\ W_i$

          Std.Error (0.006119) (0.006076)   (0.059212)

          T-stat   (1.116858) (4.781884)   (-2.178473)

Adjusted R^2 = 0.7502   S.E. of Regression = 0.012422

Durbin-Wstat = 2.13   F-statistic = 2.75

Sample Range: 1975-1996   T-critical   = 1.98

Finally, result interpretation will be concentrated on ASEAN. At 5% level of significance, two variables which are the degree of openness, and labour cost are statistically significant. This implies that these two variables are the factors that can determine the foreign direct investment in ASEAN countries. Inflow of FDI should be related to the degree of openness of an economy or region, and higher labour cost will be the causation of changing in investment. The standard error of regression is quite far from mean because the figure is shown by 0.012422 or approximately 45.18 % of the mean for dependent variables (as expected, it should close to 10 % or 15 %).

Further, the adjusted R^2 of 0.7502 can be concluded that these 2 variables (the degree of openness and labour cost) help to explain 75.02 % of the foreign direct investment in Thailand. As we consider F-test, the critical region is 2.75, so we reject H_O since it falls in the rejected area. It means that these should be at least one parameter in all parameters can explain a change of foreign direct investment. The extreme importance from the estimated regression is the Durbin Watson d statistic which indicates the presence of indecision. Concerning with 110 observations and 10 explanatory variables, the 5 % Durbin-Watson Table shows d_L = 1.634 and d_U = 1.715, the estimated d of ,therefore, is indecision.

The sign of coefficients for the degree of openness and labour cost which are statistically significant are consistent with the theories. The degree of openness has positive impact on foreign direct investment, while the labour cost has negative impact on foreign direct investment.

TABLE 3.1: SIGNIFICANT VARIABLES						
	GNP	CGNP	I	O	G	W
INDONESIA	X			X		
MALAYSIA	X				X	
PHILIPPINES	X	X				
SINGAPORE				X		X
THAILAND		X		X		
POOL				X		X

3.4 Comparision of the Determinants of FDI in ASEAN

To find the elasticity of significant variables of each countries from the estimated results, then bring them to create the elasticity comparision table for setting the policy implication in the next chapter. Another way of to look at the influence of these factors is to use the elasticity concept, we found that the elasticity are the following: If the elasticity > 1 then the variable will affect on FDI, and if the elasticity < 1 then the variable will not affect on FDI or has minute stimulation.

A. *Indonesia*

a) Elasticity of the level of GNP = coefficient x (Indonesia's the level of GNP 1996 / Indonesia's Foreign direct investment 1996)

$$= 0.036887 \text{ x } (1.25/0.022)$$

$$= 2.09$$

The level of GNP has affected on FDI, and the ratio is +2.09:1. The government enhances the economies which invest a high proportion of their GNP in plant and equipment are likely to be attractive markets for foreign investors seeking to increase their participation through

the acquisition of existing firms or the establishment of greenfield operations.

b) Elasticity of the degree of openness = coefficient x (Indonesia's the degree of openness 1996 / Indonesia's Foreign direct investment 1996)

$$= 0.00731 \text{ x } (0.48/0.022)$$

$$= 0.16$$

The degree of openness seems to have minute stimulation on the FDI in this country as shown in the table (4.2) that the ratio is just +0.16:1. Indonesia still employ several highly restrictive policies which clearly hinder the effectiveness of measures designed to reap benefits from the close association between FDI and trade. In spite of that fact, a trend towards less restrictive economic policies in the region and the popular perception that the world economic environment is becoming more protectionist and restrictive, important strides towards more open, less restrictive policies are being made in Asian. However, important steps towards a more open economic environment have been taken in recent years. Of particular interest is the recent Indonesian elimination of many incentive and regulations on foreign investors; in one sense this would appear to discourage foreign

investors lured by incentives but more equal treatment may well result in net stimulation of FDI in the end.

B. *Malaysia*

a) Elasticity of the level of GNP   =   coefficient x (Malaysia's the level of GNP 1996 / Malaysia' s Foreign direct investment 1996)

$$= 0.231104 \text{ x } (0.68/0.068)$$

$$= 2.31$$

The growth of GNP has strong incentive on FDI, and the ratio is +2.31:1. The growth of gross national product (GNP) depends on some increase in imports. The capacity to import will be determined by the country's growth in exports, commodity terms of trade, net inflow of foreign capital, and access to foreign exchange reserves.

b) Elasticity of government expenditure = coefficient x (Malaysia's government expenditure 1996 / Malaysia's Foreign direct investment 1996)

$$= 0.157373 \text{ x } (0.24/0.068)$$

$$= 0.56$$

It implied that government expenditure has small stimulation on FDI and the ratio is +0.56:1, since Malaysia thrives on its position as the country with high facilities for foreign investors, imports or exports.

C. *Philippines*

a) Elasticity of the level of GNP = coefficient x (Philippines's the

level of GNP 1996 / Philippines' Foreign direct investment 1996)

$$= 0.176237 \text{ x } (0.49/0.021)$$

$$= 4.11$$

The growth of GNP has strong incentive on FDI, and the ratio is

+4.11:1.

b) Elasticity of the change in GNP = coefficient x (Philippines's the

change in GNP 1996 / Philippines' Foreign direct investment 1996)

$$= 0.449108 \text{ x } (0.02/0.021)$$

$$= 0.43$$

The growth of GNP has small stimulation on FDI, and the ratio is

+0.43:1.

D. *Singapore*

a) Elasticity of the degree of openness = coefficient x (Singapore's the

degree of openness 1996 / Singapore 's Foreign direct investment

1996)

$$= 0.033943 \text{ x } (2.8/0.072)$$

$$= 1.32$$

The ratio of degree of openness is +1.32:1 which affect on FDI, since Singapore thrives on its position as the country with high facilities for foreign investors, imports or exports.

b)Elasticity of labour cost = coefficient x (Singapore's labour cost 1996 / Singapore's Foreign direct investment 1996)

$$= -0.324046 \text{ x } (0.21/0.072)$$

$$= -0.95$$

The labour cost has small stimulation on FDI, and the ratio is -0.95:1.

E. *Thailand*

a) Elasticity of the change in GNP = coefficient x (Thailand's the change in GNP 1996 / Thailand's Foreign direct investment 1996)

$$= 0.121644 \text{ x } (0.11/0.014)$$

$$= 0.96$$

The change in GNP which you can see that the ratio is 0.96:1. It implies that the government can intervene in the process of promoting FDI inflows by stimulating investment in private sectors both from inside and outside the country by minimizing unnecessary bureaucratic red tape and give close cooperation to the private sector to joinly table all obstacles and problems.

b) Elasticity of the degree of openness = coefficient x (Thailand's openness 1996 / Thailand's Foreign direct investment 1996)

$$= 0.054109 \times (0.86/0.014)$$

$$= 3.32$$

The degree of openness has the strong incentive on FDI in this country which you can see that the ratio is +3.32:1, hence the openness FDI policies are more conductive to the development of indigenous capabilities than restrictive policies, the most successful approaches to FDI policy will be those that emphasize incentives to do the "right" things and undertake desired activities, rather than prohibitions or limitations on activities perceived to be undesirable, which tend to discourage all investment.

The ASEAN economies are currently growing at rapid rates. Incentives for foreign investors abound, but as these economies mature and grow it is possible they will begin to suffer from some of the ills that plague the developed economies. They may, as their populations become better educated, have demands placed upon them to provide social welfare and health facilities; have to choose, eg. between inflation and unemployment; deal with demands for a better lifestyle that may conflict with a desire to keep labour costs competitive.

The consequences for foreign investors may include the raising of tariff barrier and the removal of incentives. Already there are

proposals for exclusive Economic Groups in Asia along the lines of the European Community. Foreign investors should look now to establishing long term relationships, so that they can participate in the activities that will exist in the next century.

TABLE 3.2: ELASTICITY COMPARISION						
	GNP	CGNP	I	O	G	W
INDONESIA	2.09			0.16		
MALAYSIA	2.31				0.56	
PHILIPPINES	4.11	0.43				
SINGAPORE				1.32		0.95
THAILAND		0.96		3.32		