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Impact of Export and Gross Domestic Product Towards Foreign Direct Investment Inflows in Malaysia

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Abstract: Malaysia has been encouraging Foreign Direct Investment (FDI) inflows not only for its role in technology transfer but also for its economic contribution. Identifying the factors affecting the FDI is important in explaining the Malaysian economy performance. Therefore, the aim of this study is to investigate the impact of Export (EXP) and economic growth on FDI inflows performance in Malaysia for a period of 30 years from 1979 to 2008 using the Vector Error Correction Model (VECM). In this paper, the economic growth shall be denoted by the Gross Domestic Product (GDP). 'Granger no causality test' or mostly know as Causality Test was used to test the direction of causality between the variables whereas Johansen Cointegration Test was employed to gauge the long run relationship. According to the findings, GDP 'granger cause' FDI runs unidirectionally on a short term basis. Johansen test for determining cointegration showed that the GDP has significant positive long run relationship with FDI inflows. In contrast, there was an inverse relationship between EXP and FDI inflows. Results also show that FDI, EXP and the GDP series in Malaysia are I (1) series. In conclusion, the ability of a country in manipulating its' own resources is significant in generating the economic growth. It is recommended for future researchers to include other economic indicators such as interest rate, exchange rate and inflation rate in explaining additional factors contributing to FDI inflows.

Key words: Foreign Direct Investment · Export · Gross Domestic Product · Vector Error Correction Model · Malaysian Economy

INTRODUCTION

Foreign Direct Investment (FDI) is considered responsible for increased welfare in the host country due to the advantages related to introduction of new technologies and innovations, new managerial techniques, development of additional skills, increased capital, job creation and improvement of working conditions and the development of industrial sector in the host country [1-3]. A major growth-enhancing characteristic of FDI is the advanced technology that often accompanies foreign capital investment which the domestic investors can also adopt [4]. In short, FDI should exert positive effects on economic growth, particularly in developing countries which suffer from low productivity and capital stock deficiencies [5]. Economists agree that FDI leads to an increased rate of economic growth [6]. On the other hand, there is a positive relationship between FDI and growth, conditional on various variables including initial income, financial development, trade openness, human capital development, and other proxies for host country absorptive capacity. However, there is an important implication for development strategies between FDI and growth of the causal link [7].

Malaysia is also one of those developing countries that encourage FDIs' in order to accelerate growth and development. Since 1980, the country has maintained an open policy towards trade and investment. As a result, FDI has played an important role in the capital formation and the development of the economy which has increased rapidly. In early 90's net FDI inflows contributed to almost a quarter of the country's Gross Fixed Capital Formation and equivalent to over 8% of the country's GDP [4]. Malaysia has been one of the most successful ASEAN countries in attracting FDI. Since gaining independence

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in 1957, Malaysia has taken advantage of tangible assets like resources, abundant labour as well as intangible assets like trade status under Generalised System of Preferences (GSP), macroeconomic stability, liberal trade regime, and a resourceful legal infrastructure to bring in FDI[1].

The positive relationship between FDI inflows and exports in relation to economic performance has been broadly accepted. Most of the existing research highlighted on the substitutability of relationships between exports and FDI and their complementary nature. Many of these studies however, do not discuss the issue of causality between inflows of FDI and exports. The existing literature on the Malaysian position in relation to this subject matter proves to be inadequate [8]. On the other hand, there are a lot of arguments in explaining the magnitude of the relationship between FDI inflows and Gross Domestic Product (GDP). Conceptually, the causal relationship between FDI and exports could run in either direction [9, 11, 12] had discovered that while there is a bi-directional causality from FDI to exports, there is only a one-way causality from GDP to FDI [12]. Similarly, [13] reveal that in overall terms a mutually reinforcing two-way linkage between FDI and economic growth exists in Vietnam. The results presented in this study suggest that the impact of foreign direct investment on economic growth in Vietnam will be larger if more resources are invested in education and training, financial market development and in reducing the technology gap between the foreign and local firms. Furthermore, [12] the study suggests that foreign capital has contributed positively to China's economic growth. Therefore, this study seeks to determine the influence of exports and GDP on the stability of FDI inflows in Malaysia in the long and short run perspectives.

Literature Review: A study by [15] had mentioned that the impact of the FDI on the growth rate of output was constrained by the existence of diminishing returns in the physical capital. [16] highlighted that FDI can grow if it results in increasing returns in production through spillover and technological transfers via diffusion process. In addition, [17] argues that technology transfer depends on the diffusion process and that can take place through four modes which are transfer of new technologies and the ideas, high technology imports, foreign technology adoption and the level of human capital. Surveying the macro-level empirical research, [18] notes there is no consistent relation between the size of inward FDI flows and GDP. [19] founds that while substantial support exists for positive spillovers from FDI, there is no consensus on causality Meanwhile, the role of FDI has been widely recognized as a growth-enhancing factor in the developing countries [20, 21] also states that the FDI helped economic growth in many Asian countries during the 1970s and 1990s. The relationship between FDI and economic growth has motivated many empirical literatures focusing on both industrial and developing countries [22].

[3]states that trade and FDI are positively related (complementary) between asymmetric countries and negatively (substitute) between symmetric countries . Similarly,[23] also contends that a greater export level may encourage greater FDI in the host country when FDI is regarded as complementary to trade. If FDI is regarded as a substitute to trade, a high level of exports may not increase the inflows of FDI. It is clear that expansion of exports can results from FDI, if there are relatively large differences in resource endowments between the home countries and host country [24]. Several studies conducted at many different countries also found that FDI have a positive effect on export performance of host countries, as found in Ireland and Portugal [25-27] observed that a country's orientation toward exports is the strongest variable for explaining why a country attracts FDI.

A study by [23] found that there is a relationship between GDP and FDI. [28] conducted a study using Chile, Malaysia and Thailand as their main focus and find a bi-directional causal link between FDI and economic growth for Malaysia and Thailand, though they also find that GDP causes FDI in the case of Chile . Although there is no universal agreement about the positive association between FDI inflows and economic growth, in other way, the consensus seems to be that there is a positive association. Hence, these have become the topic of some recent studies for the reason of the causality issue [29].

[30] argued that FDI does exhibit a significant positive relationship with economic growth, at least, for those transitional countries that are characterized by high levels of income and have implemented successful privatization programs. [22] found no strong evidence of causal relationship between FDI and economic growth in Malaysia. [31]emphasized trade openness as a crucial determinant for the impact of FDI on growth, as they find two-way causality in open economies, both in the short and the long run, whereas the long run causality is unidirectional from growth to FDI in relatively closed economies. Theoretically, the growth of the emerging and transition economies has been affected by inflow of FDI [32].

[1]Tradechakra, 2008. FDI in Malaysia. Retrieved September 15, 2010 from www.tradechakra. com/econo my/malaysia/fdi-in-malaysia-198.php

Methodology: The data covers a 30-year period from 1979 to 2008. The data been collected from the World Bank, World Investment Report 2009. All variables are expressed in logs. The model uses time series dataset of two independent variables; consisting of ln(EXP) and ln(GDP) as independent variable and ln(FDI) as dependent variable. The model is as follows;

$$\ln(FDI_t) = \alpha + \beta_1 \ln(EXP_t) + \beta_2 \ln(GDP_t) + u_t \quad \text{(Equation 1)}$$

Unit-Root Test: The unit root test is used for the purpose of ensuring the variables are integrated as non- stationary series could result in spurious regression. All variable in the model were tested for stationarity by conducting the both augmented Dickey-Fuller test (ADF) and Phillips-Perron (PP) unit root tests. The series of two-tails T-test at 1%, 5% and 10% level of significance have been assessed on each independent variable. The ADF test is based on the regression equation with the inclusion of a constant and a trend of the form:

$$\Delta X_t = \beta_0 + \mu_t + \delta X_{t-1} + \sum_{i=1}^{k} \alpha_i \Delta X_{t-i} + \varepsilon_t \quad \text{(Equation 2)}$$

Where Xt = Variables of interest in the logarithm forms at time trend *t*, ?X_{t-i} expresses the first differences with *k* lags, ε is the white noise residual of zero mean and constant variance. The coefficients {â$_0$, δ, μ_t, á$_1$,…, á$_k$} are parameters being estimated. The null and the alternative hypothesis for the existence of unit root in variable X_t is;

H_0: δ = 0 (X_t is non stationary or contains a unit root)
H_1: δ ≠ 0 (X_t is stationary or non unit root)

(Equation 3)

If the the probability (p-value) is less than the level of significance; we can reject the null hypothesis, vice versa.

Tests for Cointegration: The [33] test is a method of cointegration testing based on the maximum likelihood estimation of the VAR model to determine the number of cointegrating vectors in the analysis. The [34] method is employed to test for the long run relationship between variables in a multivariate model. The analysis is based on the following equations:

$$Y_t = A_1 Y_{t-1} + A_2 Y_{t-1} + \ldots\ldots + A_\rho Y_{t-\rho} + \varepsilon_{t-p} \quad \text{(Equation 4)}$$

Where Y_t is a *k*- vector of non stationary 1(1) variables, A with i=1,…, ρ is a lag operator and ε_t is a the white noise residual of zero mean and constant variance. The lag order ρ is determined using Akaike's Information Criterion (AIC) as mentioned by [34]. Then, we can test the null hypothesis that is *r* power or fewer cointegrating vectors using the following two likelihood ratio tests statistics:

Trace Test: The trace statistics hypothesize the null hypothesis that there are at most *r* cointegrating vectors against the alternative of *r* or more cointegrating vectors.

$$\tau_{trace} = -N \sum_{i=r+1}^{m} \ln[1-(r_i^*)^2] \quad \text{(Equation 5)}$$

Where N is the total number of observations, M is number of variables and r_i^* is the *i* correlation between *i*-th pair variables. τ_{trace} has a chi-square distribution with M-*r* degrees of freedom. Large values of τ_{trace} give evidence against the hypothesis of r or fewer cointegration vectors.

Maximal Eigenvalue Test: Meanwhile, the maximal eigenvalue statistics tests are for *r* cointegrating vectors against the alternative of *r*+1 cointegrating vectors. This test evaluates the null hypothesis:

H_o : r = r_0 (No Cointegration)
H_1 : r = r_0 +1 (Cointegration)

$$\tau_{max} = -T \ln(1-\lambda_{r+1}) \quad \text{(Equation 6)}$$

Nevertheless, [33] suggest that the maximal eigenvalue test is more powerful than the trace test.

Causality Analysis with VECM: Samsu *et al.* [8] employed the vector autoregression (VAR) technique and regressed on the variables' own lags and the lag of other variables. To examine the causal linkages, they specify a vector error correction model (VECM) as follows:

$$\Delta \ln FDI = \delta_0 + \delta_1 \sum_{i=1}^{p} \delta_{1i} \Delta \ln FDI_{t-1} + \delta_2 \sum_{i=1}^{p} \delta_{2i} \Delta \ln GDP_{t-1} + \delta_3 \sum_{i=1}^{p} \delta_{3i} \Delta \ln EXP_{t-1} + \delta_4 \, ect_{t-1} + \mu_1 \quad \text{(Equation 7)}$$

$$\Delta \text{ In EXP} = \delta_0 + \delta_1 \sum_{i=1}^{p} \delta_{1i} \Delta \text{InEXP}_{t-1} + \delta_2 \sum_{i=1}^{p} \delta_{2i} \Delta \text{InFDI}_{t-1} + \delta_3 \sum_{i=1}^{p} \delta_{3i} \Delta \text{InGDP}_{t-1} + \delta_4 \text{ ect}_{t-1} + \mu_1$$

(Equation 8)

$$\Delta \text{ In GDP} = \delta_0 + \delta_1 \sum_{i=1}^{p} \delta_{1i} \Delta \text{InGDP}_{t-1} + \delta_2 \sum_{i=1}^{p} \delta_{2i} \Delta \text{InEXP}_{t-1} + \delta_3 \sum_{i=1}^{p} \delta_{3i} \Delta \text{InFDI}_{t-1} + \delta_4 \text{ ect}_{t-1} + \mu_1$$

(Equation 9)

Where ect_{t-1} is the error correction term generated from the cointegrated regression from the Johansen multivariable process, μ_t are disturbance terms, Δ denote first differences required to induce stationary for corresponding variables and the estimated coefficient of δ_1, δ_2 ……δ_3 indicates the 'short run' causal effects, shown by the F-test of the explanatory variables whereas the coefficient of ect_{t-1} measures the 'long run' causal relationship implied through the significance of the t-statistics [35] Stressed that the VEC modeling is used to observe an additional channel for causal linkage among cointegrated variables. They added that the VECM allows us to distinguish between short term and long term Granger causality.

RESULTS AND DISCUSSION

Augmented Dicker-Fuller (ADF) and Phillip-Perron (PP) unit roots tests were employed to test for the stationarity of the macroeconomic series at level and then first difference of each series. The results of the ADF and PP tests at level and first difference are reported in Table 1. At level, the t-statistics for all the series from both ADF and PP test are statistically insignificant. This indicates that these series are non-stationary at their level form. In conclusion, these variables contain a unit root or they share a common stochastic movement. When the ADF test is conducted at first difference of each variable, the null hypothesis of non-stationary is rejected at 1% significance level. This is consistent with some previous studies that most of the macroeconomics and financial series are expected to contain unit root and thus integrated of order one. A similar conclusion also comes from PP test. The conclusion from the above result is that the FDI, EXP and the GDP series for Malaysia are I (1) or integrated at order one.

Table 1: Unit Root Test

Variables	ADF p-value for z(t)		PP p-value for z(t)	
FDI	0.2953	0.0000	0.2963	0.0000
EXP	0.9550	0.0004	0.9540	0.0005
GDP	0.9761	0.0014	0.9720	0.0019

Table 2: Johansen Test for Cointegration

Johansen tests for cointegration

Trend: constant — Number of obs = 26
Sample: 1983 - 2008 — Lags = 4

maximum rank	parms	LL	eigenvalue	trace statistic	5% critical value
0	30	52.507548	.	34.7742	29.68
1	35	65.605026	0.63487	8.5793*	15.41
2	38	67.802429	0.15552	4.1845	3.76
3	39	69.894661	0.14866		

Table 3: Cointegration Equation (VECM) Result

Cointegrating equations

Equation	Parms	chi2	P>chi2
_ce1	2	37.35535	0.0000

Identification: beta is exactly identified
Johansen normalization restriction imposed

beta		Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
_ce1							
	lnfdi	1	.	.	.	.	.
	lnexp	-1.920724	.7067537	-2.72	0.007	-3.305936	-.5355125
	lngdp	2.880562	1.630114	1.77	0.077	-.3144037	6.075527
	_cons	-47.74926	.	.	.	.	.

Table 2 shows the result of Johansen cointegration test. Both trace and max eigenvalue? tests indicate that the variables are cointegrated. The multivariate cointegration test based on [5] has been used to determine the long run relationship and captured the dynamic relationship among the three variables. The maximum eigenvalue test is 0.63487 and trace statistical value is 8.5793. [5] cointegration test for the model shows a cointegration at rank one. The computed values of null hypothesis of r=0 and r=1 are greater than the critical values; therefore, we should reject at least the 5% significance level against the null. This implies that a significant cointegrating relationship existed connecting three variables in a long run relationship. This result is supported by [36].

The estimated cointegrating equation derived from Table 3 is as follows:

Table 4: Granger Causality Test

Relationship	Result p-value for chi^2
FDI _ EXP	0.2787
EXP _ FDI	0.1376
FDI _ GDP	0.5227
GDP _ FDI	0.0018

$$FDI = -1.9207\ EXP + 2.8806\ GDP - 47.7492 \quad \text{(Equation 1)}$$

In the long run, 1% increase in export, 1.9207% will decrease in Malaysian FDI inflows. The negative relationship between exports with FDI in the long run is supported by [37]. According to them, in a growing economy, this can be result of human capital accumulation, cumulative productive process, transfer of technology via direct investment or physical capital accumulation which is not related to any government specific export promotion measure. The FDI may reduce exports by manufacturing goods directly in the host countries to save transportation costs. Since most of the population comes from the middle income class, it is possible to assume as such. It is also expected as the host country can rely more on its' own internal financial resources such as Employees Provident Fund, Army Trust Fund Board and Pilgrim Fund Board in Malaysia. These internal resources may generate more export oriented products rather than just depending on the FDI alone. On the other hand, 1% increase in GDP, will increase the 2.8806 % in Malaysian FDI inflows. The positive relationship is supported by [23, 29, 38]. The strength of GDP of a host country made the profit rational investor will always seek to make an investment in the country. The GDP may also reflect the stability of political, economic and social for a country.

From Table 4, there is no causality between FDI inflows and EXP in any directions since the null cannot be rejected at 10%, 5% and 1% significance level. As a conclusion, there is no relationship between these two variables in the short run. This may hint why there is a negative relationship in the long run as shown in Table 3. In contrast, the GDP "granger cause" FDI at 1% significance level and FDI does not "granger cause" GDP in the reversal mode. This supports the long run result where GDP has positive influence on the FDI. It is clear cut that economic performance indicated by the GDP growth is one of the main indicators in attracting outsiders to invest in this country. The mixed economy system which is implemented by the Malaysian government promises a suitable portion for the public and private sectors to perform their role consecutively in developing the country economic.

CONCLUSION

This study is successful in aligning different time lengths together. In the short run, there is no relationship between FDI inflows and EXP whereas there is a negative association in the long run. This concludes that the FDI is not everything. The ability of a country in manipulating its own resources is significant in generating the economic growth. Meanwhile, there is an impact of GDP on FDI in the short run and positive connection in the long run. As stressed earlier, economic indicator plays a vital role in attracting foreign investment to the country. Hence, it is recommended for future researchers to include other economic indicators such as interest rate, exchange rate and inflation rate in explaining additional factors contributing for FDI inflows.

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