E C O N O M I C S B U L L E T I N

Outward FDI of Malaysia: An Empirical Examination from Macroeconomic Perspective

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Abstract

Outward FDI of Malaysia was nearly non-existent prior to 1970s. Nonetheless, recently Malaysia has not only been able to sustain FDI inflows position, but also emerged as the fifth largest investor among the developing economies in Asia region (UNTACD, 2005). This study aims to investigate the selected macroeconomic determinants of outward FDI of Malaysia, namely income, exchange rate and openness. The Johansen and Juselius cointegration test and the vector error correction model are applied in this study to analyze the quarterly data from 1991:Q1 to 2004:Q4. The findings verified that the outward FDI of Malaysia is determined by income, exchange rate and openness of the economy in both the short- and long-run.

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1. Introduction

Over the past two decades, FDI flows have grown at remarkable rates, with outflows averaging over 28 percent per annum from 1991 to 2000 (UNCTAD, 2004), greatly outpacing growth of exports. Developing countries registered record levels of FDI inflows and outflows in 1998 amounting USD460 billion (68 percent more than 1997) and USD595 billion (46 percent more than 1997), respectively. FDI in developing countries has fluctuates over time, as investors have responded to changes in the environment for investment, including government policies toward FDI and the wider economic policy framework. As an emerging market, Asia is one of the regions in the world in which FDI activities are prevalent.

On the other hand, some developing countries especially in Asia also emerged as important sources of FDI. Malaysia is among the developing countries that involves in abroad investment. Initially, Malaysia adopted an import substitution industrialization strategy in 1960s with the purpose to fulfill domestic market demand. This policy has contributed to influx of FDI as encouraged by Malaysia as a mean to gain advanced technologies. Notwithstanding, Malaysia has shifted towards export-oriented since 1971 and contributed to gradually economic growth coupled with favorable investment environment. Malaysia abroad investment instigated to expand rigorously from 1993 onwards (see Table 1). However, the contribution of Malaysia towards the FDI outflows was inconsistent as there has been a sudden decline in 1998 and 2001 due to the Asian financial crisis and economic recession respectively. In 2004, few Malaysian companies had expanded vigorously by investing abroad and thus been included in the Top 100 non-Financial Transnational Corporations. For instance, the top three companies are PETRONAS which ranked second, YTL Corporation Berhad and MISC Berhad which ranked thirty-second and forty-fifth, respectively (UNTACD, 2006).

Viewing the robustness of the economic development nowadays particularly the trade liberalization as well as economic integration, there is a need for Malaysia to study the major determinants that lead to outward FDI. As such, this study investigates the selected macroeconomic determinants of FDI outflows from Malaysia, namely income, exchange rate and openness as proposed Kyrkilis and Pantelidis (2003). In addition, the current study also embraces the Investment Development Path (IDP) concept suggested by Dunning (1979) and adopted by Ramasamy (1998)[1] to investigate the Malaysia position in the IDP especially aftermath the Asian financial crisis.

2. Key Determinants of Outward FDI

There are several theories on the development and motivation of FDI that are relevant in explaining the outward FDI activities. Market Imperfections Theory (Hymer, 1970) emphasizes on the capitalization on certain capabilities not shared by rivals in foreign countries which lead to firm's decision to invest overseas. Meanwhile, International

[1] IDP comprises of five stages of FDI development – Stage 1: Low level of inward FDI rate and barely existence of outward FDI; Stage 2: Gradually increment of inward as well as outward FDI growth rate; Stage 3: Growth rates of inward and outward FDI increase; Stage 4: Growth rate of outward FDI exceeds inward FDI; Stage 5: Outward and inward FDI growth rate continue to expand. Ramasamy concluded that Malaysia is in the later part of stage 3 in the IDP where the rate of growth of both inflows and outflows of FDI is increases.

Production Theory (Dunning, 1980 and Fayerweather, 1982) focuses on the propensity of a firm to initiate foreign production depend on the specific attractions of its home compared with resource implications and advantages of locating in another country. One of the most popular theories is the Ownership, Internalization and Locational (OLI) Eclectic Paradigm (Dunning, 1980, 1993) in which foreign investment occurs because firms have certain ownership (O) advantages, which they exploit through a process of internalization (I) in countries that offer the requisite locational (L) advantages.

The main factor contributed to the outward FDI can be linked to the income of a country. Increase in the income of a country eventually will lead to structural changes to the economy of the country. The mounting of income enables firms to gain competitive advantage by enlarging the production scale as well as adoption of new technology[2]. Ultimately, firms are able to acquire ownership advantages which become the driving force for establishing foreign production (Lall, 1980; Grubaugh, 1987). Bulatov (2001) and Mulino (2002) showed that the leading factors for outward FDI include the striving of parent companies to know the business situation and provide their presence on foreign markets in order to provide assistance to their own export and import operations via foreign affiliates. Meanwhile, Hsien and Yang (2003) found that Small and Medium Enterprises (SMEs) play a vital role in abroad investments where larger firm sizes, higher export ratios, or high level of research and development (R&D) among SMEs will lead to greater intention to undergo FDI. In term of service-oriented firms, the findings from a survey conducted by Javalgi et al. (2003) on 228 business-to-business service firms in Spain discovered that larger business is more likely to operate internationally. This is due to the fact that larger firms have more resources to commit to international expansion and capable in coping with the risk linked with it. On the other hand, Kyrkilis and Pantelidis (2003) noticed that income is the most important determinant of FDI outflows for Germany[3]. In addition, they also found that exchange rate is an influential factor in affecting the outward FDI of Brazil and Singapore. This is similar to the finding by Aliber (1970) where appreciation of the currencies enables firms from those countries to gain benefits in term of financial to support their abroad investment in relative to countries with weaker currencies.

3. Methodology

The data used in this study include of outward FDI, income of home country, real effective exchange rate and openness of the economy. The income is measured in Gross Domestic Product (GDP) while the openness indicates the addition of export and import as suggested by Kyrkilis and Pantelidis (2003). The sample period ranges from 1991:Q1 to 2004:Q4. All the data were obtained from World Investment Report, UNCTAD and International Financial Statistics of International Monetary Fund. All the variables were transformed into natural logarithm form before any estimation is conducted.

The functional relationship of outward FDI and its determinants in this study is then represented by Equation (1) as follows:

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[2] See for example, Chenery et al. (1986) and Aykut and Ratha (2004).

[3] The model developed identifies the main determinants of FDI outflows using time series data for five EU members (France, Germany, Italy, the Netherlands and the U.K.) and four non-European Union countries (Korea, Brazil, Singapore and Argentina).

$$LOFDI = \beta_1 + \beta_2 LGDP + \beta_3 LREER + \beta_4 LOPEN + e \quad (1)$$

where *LOFDI* indicates logarithm of outward FDI, *LGDP* indicates logarithm of host country income measured by GDP, *LREER* indicates logarithm of real effective exchange rate, *LOPEN* indicates openness of the economy, β_s are coefficients to be estimated and *e* is an error term.

The vector error-correction model (VECM) which consists of the error-correction term (*ECT*) is adopted in order to capture the long run variation from the equilibrium linkage between outward FDI and the determinants. Maximum likelihood of the Johansen test is used to a vector autoregressive (VAR) as in Equation (2).

$$\begin{bmatrix} \Delta LOFDI_t \\ \Delta LGDP_t \\ \Delta LREER_t \\ \Delta LOPEN_t \end{bmatrix} = \Gamma(L) \begin{bmatrix} \Delta LOFDI_{t-1} \\ \Delta LGDP_{t-1} \\ \Delta LREER_{t-1} \\ \Delta LOPEN_{t-1} \end{bmatrix} + \Pi \begin{bmatrix} \Delta LOFDI_{t-1} \\ \Delta LGDP_{t-1} \\ \Delta LREER_{t-1} \\ \Delta LOPEN_{t-1} \end{bmatrix} + \begin{bmatrix} \varepsilon_{OFDI} \\ \varepsilon_{GDP} \\ \varepsilon_{REER} \\ \varepsilon_{OPEN} \end{bmatrix} \quad (2)$$

where $\Gamma(L)$ is a 4x4 polynomial matrix of coefficients to be estimated. *L* refers to the lag operator and Γ indicates the short run adjustments among the variables across the four equations in the system. Δ represents the first difference operator, Π denotes the error-correction component in levels and ε's refer to the white noise error terms.

Prior conducting cointegration test, time series properties of the variables will be examined via Augmented Dickey-Fuller (ADF) (Dickey and Fuller, 1979; 1981) unit root test. If the variables are nonstationary and not cointegrated, standard VAR will be adopted for estimation. Nevertheless, if the variables are nonstationary and outward FDI is cointegrated with the stated determinants in this study, VECM will be employed. The long run cointegrated relationship denotes that the residuals from the cointegration equation can be used as an error-correction representation as in Equation (3):

$$\Delta LOFDI_t = \beta_0 + \sum_{k=1}^{a} \beta_1 \Delta LOFDI_{t-1} + \sum_{k=1}^{a} \beta_2 \Delta LGDP_{t-1} + \sum_{k=1}^{a} \beta_3 \Delta LREER_{t-1} + \sum_{k=1}^{a} \beta_4 \Delta LOPEN_{t-1} + \alpha ECT_{t-1} + e_t \quad (3)$$

The coefficient (α) on the *ECT* measures the respond of the outward FDI to a departure from equilibrium in a single period. There are two paths in detecting the causality: via the statistically significance of *t*-test for lagged *ECT* and the other via the *F*-tests applied to the joint significance of the sum of the lags of each respective independent variable in the system (see Granger, 1988). The *t*-test of the lagged ECT denotes the long run causal linkage of the model while the *F*-tests of the independent variables in their first differences indicate the short run causal effects.

4. Empirical Results

The ADF unit root test result is presented in Table 2. Estimation result shows that the null hypothesis of a unit root cannot be rejected at level form, however, it can be rejected after first differencing, indicating all the variables are *I*(1). Therefore, we proceed with the cointegration test in the next step to examine the existence of a long run relationship among stationary variables that are integrated with same order. Table 3 depicts the Johansen-Juselius multivariate cointegration maximum likelihood test results[4]. The null hypothesis of non-cointegration (r=0) is rejected by the maximum eigenvalue ($\lambda_{\max}$) statistics at 1% significant level. Nevertheless, the null hypothesis of at most one cointegrating vector cannot be rejected, implying the existence of a single cointegrating vector in the model and ultimately there is a stable long run linear equilibrium linkage among the variables under study.

Table 4 reports the normalized cointegrating vector and the likelihood ratio exclusion test results. The coefficient estimates of the cointegrating vector are provided by β' = (-1.00, 1.95, 11.00, 5.59) which are statistically significant at 1% level. These values indicate long run elasticity of the variables. The outcomes show that outward FDI is elastic with respect to all the explanatory variables and it is positively related to income, real effective exchange rate and openness of the country.

Next, the relations among the variables in the system are investigated via error-correction model. Table 5 tabulates the estimation of error-correction model for outward FDI. This model is satisfactory as proven by the diagnostic tests. The estimated residuals have normal distribution pattern, homoskedasticity variances, serially uncorrelated and well specified. Furthermore, the recursive estimates of CUSUM and CUSUM of squares tests (Figures 1 and 2) indicate that the model is relatively stable as the cumulative sums are fall inside two-standard deviation band. The estimated coefficient of the *ECT* is statistically significant with a negative sign. This means that outward FDI may deviate from its long run equilibrium temporarily, however, the deviation is adjusting towards equilibrium level in the long run. Our result shows that outward FDI needs about slightly more than two quarters to adjust to the long run equilibrium due to the short run disturbances.

Table 6 indicates the results of short run causality test from error-correction model by applying the *F*-test of overall significance in the Wald test context in order to examine the joint significance of the sum of the lags of each independent variable in first difference form. The condition where null hypothesis of no causal effect cannot be rejected implies that the variable does not Granger cause outward FDI in the short run. Empirical results depict existence of short run causal linkage from income, real effective exchange rate and openness of the country to outward FDI.

5. Discussions

Our findings indicate that income, exchange rate and openness of the economy play major role in determining the outward FDI of Malaysia. These variables have the similar significance positive relationship with outward FDI in the long run as proven by Kyrkilis and

[4] Johansen and Juselius (1990) verified that the maximum eigenvalue test is rather powerful and produces more vigorous outcomes in relative to the trace test.

Pantelidis (2003). The positive long run linkages between FDI outflows and income are in fact elastic where changes in level of income will have great impact on the outward FDI of Malaysia. The mixture of ownership (O), location (L), internalization (I) advantages of Malaysia firms has significance impact on the country's economic development itinerary[5]. The adoption of export-oriented strategy eventually transformed the economic structure of Malaysia rapidly from agriculture-based economy to manufacturing-based economy since 1980s. The favorable economic performance prior to 1997 and sustainable economic growth commencing 2001 due to adoption of appropriate economic policies had contributed to consistent GNP growth of Malaysia. Therefore, the ability of the Malaysia firms in utilizing their income will increase the propensity of the firms to participate vigorously in abroad investments.

The study also discovers existence of significance positive long run relationship between exchange rate and outward FDI. The justification for the scenario can be based on study by Aliber (1970) who argued that firms from countries that have strong currencies are able to support their foreign investments better in financial aspect compared to the firms from countries with weak currencies. In this context, there are two main scenarios that consist of prior and post Asian financial crisis in 1997. The Ringgit Malaysia had experienced appreciation due to robust economic performance in the first half of 1990s. Malaysia has a strong currencies condition before the financial crisis which is RM2.70/USD in 1993 and appreciated to RM2.52/USD in 1996. Besides, the FDI outflows from Malaysia also increased more than 80% from USD2,063 millions in 1993 to USD3,768 millions in 1996 (UNCTAD, 2005). The appreciation of the currency lowers the capital requirements of foreign investments and enabling the Malaysian firms to gain capital easier. On the other hand, as the Ringgit Malaysia endured steep depreciation from RM2.60/USD in July 1997 to RM4.70/USD in January 1998, the pegging of Ringgit Malaysia against US dollar at RM3.80/USD on 1 September 1998 in fact indicates appreciation of Ringgit Malaysia relatively. Floating the Ringgit Malaysia indicated further depreciation of the currency but pegging at RM3.80/USD undeniably strengthened the currency during that time. Therefore, the firms had the propensity to expand abroad due to relatively stronger currency as most of the transactions were based on US dollar instead of Ringgit Malaysia.

Meanwhile, the openness of the country has a positive relationship towards the outward FDI as well. One of the major reasons is due to the economic policy adopted by Malaysia particularly export-oriented approach since 1970s. The expansion of Malaysia export activities simultaneously with robustness of trade liberalization momentum in 1990s enables firms to obtain information regarding foreign market and knowledge as well as skills in establishing operations abroad. Ultimately, firms will have the propensity to shift the mode from exporting to FDI as they are equipped with sufficient knowledge on the foreign market.

6. Conclusion

This study investigates the linkages between outward FDI of Malaysia and the determinants, which consist of income, exchange rate and openness. The normalized cointegrating vector indicates that Malaysia outward FDI is elastic with respect to income, exchange rate and openness of the economy. Continuous income expansion, stronger currency and further liberalizing the economy enable Malaysian firms in gaining more capital as well as

[5] See for example, Dunning (1993) and Dunning and Narula (1996).

technology and ultimately stimulate the abroad investments. Therefore, efforts in attracting greater volume of FDI into Malaysia as well as encouraging outward FDI are crucial. Based on the IDP framework, Malaysia is going towards the later parts of stage 3 and on the path of shifting towards stage 4 where the growth rate of outward FDI has significantly exceeds the growth rate of inward FDI from 2002 to 2005 (UNCTAD 2006). This circumstance provides an overview that Malaysia is going on the right track of economic development. The time frame for achieving the next stage can be shorten if Malaysia particularly and ASEAN members generally make a transition from a paternalistic top down governance structure to a pluralistic market economy structure. Besides, Malaysia should grab the opportunity from the emergence of fast growing economies like India and China in the world market. For instance, by locating production in low labor cost of China, Malaysia can gain competitive advantage in terms of price and therefore able to compete and survive in the challenging market. Outward FDI expansion will definitely increase the economic growth and consequently benefits the Malaysian in terms of standard of livings, choices of goods and technology. However, the decisions to invest abroad must take consideration on both external and internal factors.

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APPENDIX

Table 1: FDI Outflows from Malaysia, 1990-2005 (USD Millions)

Year	FDI Outflows	Year	FDI Outflows
2005	2,971	1997	2,626
2004	2,061	1996	3,768
2003	1,370	1995	2,488
2002	1,904	1994	2,329
2001	267	1993	1,063
2000	2,026	1992	115
1999	1,422	1991	175
1998	863	1990	129

Source: UNCTAD, various issues.

Table 2: ADF Unit Root Tests Results

Variable	Level	First Difference
LOFDI	-2.943(1)	-5.157(1)***
LGDP	-1.895(5)	-3.919(4)***
LREER	-2.764(1)	-5.222(0)***
LOPEN	-1.811(0)	-6.397(0)***

Notes: LOFDI = natural log of outward FDI, LGDP = natural log of nominal GDP, LREER = natural log of real effective exchange rate and LOPEN = natural log of openness of the economy. Asterisks (***) indicate significant at 1% level.

Table 3: Johansen and Juselius Cointegration Test Results

H_0	H_1	λ_{max}	$CV_{(max, 5\%)}$
Variables: LOFDI, LGDP, LREER, LOPEN			
$r = 0$	$r = 1$	48.133***	27.584
$r \leq 1$	$r = 2$	15.566	21.132
$r \leq 2$	$r = 3$	11.535	14.265
$r \leq 3$	$r = 4$	0.297	3.841

Notes: r is the number of cointegrating vector. Asterisks (***) indicate significant at 1% level. Lag selection is based on Final Prediction Error criterion.

Table 4: Johansen Cointegration Equation Parameter Estimates and Likelihood Ratio Restriction Tests

	Parameter Estimates	Test for Exclusion	
	Normalized	H_0	LR(1)
Constant	71.521		
LOFDI	1.000	β_1	32.552***
LGDP	1.952	β_2	8.930***
LREER	11.007	β_3	23.974***
LOPEN	5.592	β_4	9.429***

Note: Asterisks (***) indicate significant at 1% level.

Table 5: Estimation of ECM for Outward FDI

Variables	Coefficients	Std. Errors	*t*-statistics	*p*-values
Constant	-0.267	0.134	-1.995	0.057
ECT_{t-1}	-0.441	0.135	-3.271	0.003
$\Delta LOFDI_{t-1}$	0.658	0.148	4.457	0.000
$\Delta LOFDI_{t-2}$	-0.126	0.133	-0.944	0.354
$\Delta LOFDI_{t-3}$	0.247	0.114	2.170	0.040
$\Delta LOFDI_{t-4}$	-0.144	0.101	-1.422	0.168
$\Delta LOFDI_{t-5}$	0.294	0.098	2.987	0.006
$\Delta LGDP_{t}$	9.457	2.304	4.104	0.000
$\Delta LGDP_{t-1}$	0.531	2.027	0.262	0.796
$\Delta LGDP_{t-2}$	2.838	1.607	1.767	0.090
$\Delta LGDP_{t-3}$	2.385	1.725	1.382	0.179
$\Delta LGDP_{t-4}$	-6.020	1.881	-3.201	0.004
$\Delta LGDP_{t-5}$	2.068	1.825	1.134	0.268
$\Delta LREER_{t}$	4.576	1.712	2.673	0.013
$\Delta LREER_{t-1}$	-2.945	2.044	-1.441	0.162
$\Delta LREER_{t-2}$	-2.843	1.760	-1.616	0.119
$\Delta LREER_{t-3}$	-1.417	1.818	-0.779	0.443
$\Delta LREER_{t-4}$	-6.460	2.143	-3.015	0.006
$\Delta LREER_{t-5}$	1.541	2.106	0.732	0.471
$\Delta LOPEN_{t}$	3.867	1.809	2.137	0.043
$\Delta LOPEN_{t-1}$	0.623	1.517	0.410	0.685
$\Delta LOPEN_{t-2}$	-3.023	1.514	-1.998	0.057
$\Delta LOPEN_{t-3}$	-0.679	1.541	-0.441	0.663
$\Delta LOPEN_{t-4}$	-0.977	1.580	-0.618	0.542
$\Delta LOPEN_{t-5}$	2.019	1.688	1.196	0.243
Diagnostic Tests:				
JB	5.944[0.051]			
AR[4]	0.891[0.486]			
ARCH[1]	1.631[0.208]			
HETERO	1.839[0.536]			
RESET[1]	0.917[0.348]			

Notes: JB is the Jarque-Bera statistic for residuals normality test. AR and ARCH are the Lagrange Multiplier tests of serial correlation and ARCH effects, respectively. HETERO and RESET refer to White Heteroscedasticity test and Ramsey RESET specification test.

Table 6: Short-run Granger Causality Test Results

Null Hypothesis	*F*-statistic of Wald Test [*p*-value] $\Delta LOFDI_t$
$\sum_{i=1}^{5} \Delta LOFDI_{t-1}$	5.097 [0.002]***
$\sum_{i=0}^{5} \Delta LGDP_{t-1}$	3.309 [0.016]**
$\sum_{i=0}^{5} \Delta LREER_{t-1}$	2.622 [0.041]**
$\sum_{i=0}^{5} \Delta LOPEN_{t-1}$	2.123 [0.086]*

Notes: Asterisks (*) and (**) indicate significant at 10% and 5% levels, respectively.

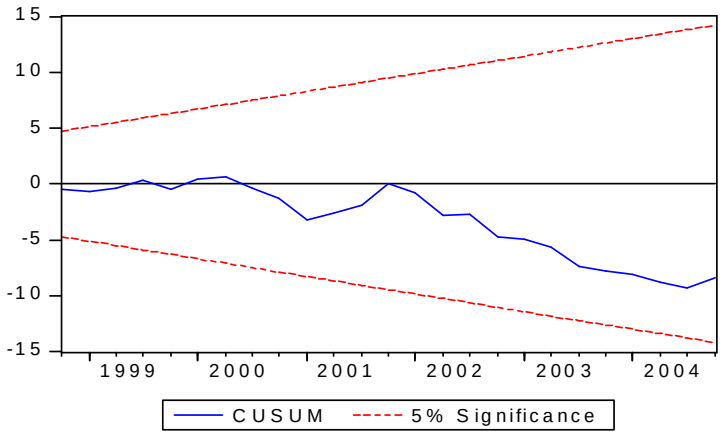

Figure 1: CUSUM Stability Test for Outward FDI ECM

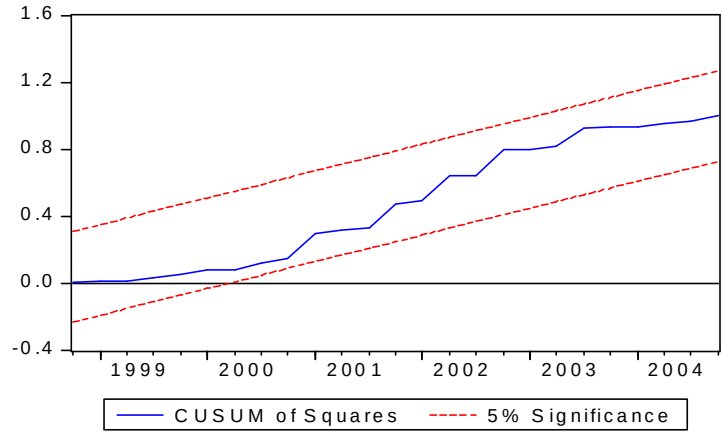

Figure 2: CUSUM of Squares Stability Test for Outward FDI ECM