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# **The relationship between trade openness, foreign direct investment and growth: Case of Malaysia**

by

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## **ABSTRACT**

This study examines the role of trade openness and foreign direct investment in influencing economic growth in Malaysia during 1975-2005, using the Bounds testing approach suggested by Pesaran et al. (2001). The empirical results demonstrate that trade openness is positively associated and statistically significant determinant of growth, both in short run and the long run. The result also suggested that foreign direct investment is positively associated in the short run and negatively associated in the long run, both significantly. Besides these two variables, the other control variable namely exchange rate is also significant in the short run as well as in the long run.

## **1.0 Introduction**

International free trade has often been referred to as the “engine of growth” that propelled the development of today’s economically advanced nations during the nineteenth and early twentieth centuries. Rapidly expanding trade especially or specifically the export sector provided an additional stimulus to growing local demands that led to establishment of large scale industries.

In some individual countries, notably South-East Asia, the growth of exports has exceeded ten percent per annum. Exports have tended to grow fastest in countries with more liberal trade regime, and these countries have experienced the fastest growth of GDP<sup>†</sup>.

## **2.0 Objectives of the study**

Studies have flourished recently on economic growth and its determinants. However very few researchers have taken into consideration the level of trade openness as an independent variable in their research, and since economic theories even from the classical era have pointed the importance of being involved in trade as an important element in growth.

The objective of this study is to evaluate the role of trade openness on economic growth. Other control variables in the specification are, foreign direct investment (FDI) and exchange rate (EX). These variables are included in this research because

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<sup>†</sup> A.P.Thirlwall “Trade Agreements, Trade liberalization and Economic Growth: A Selective Survey”

past studies and economic theories have pointed out the importance of these variables as a stimulant for economic growth and to get a more accurate result. It is also to avoid the mistake of missing variables or big errors.

### 3.0 Review of Related Literature and Empirical Evidence

The results obtained by David Barlow (2006), Panagariya (2004), Chui, Levine, Murshed and Pearlman (2002) are mixed. While Barlow (2006) discovered that the level of trade liberalization is found to raise the growth rate, particularly in the early part of the transition and for the countries nearest to the European Union, Panagariya (2004) found mixed results between countries, while there are countries enjoying good growth in their economic performance due to trade openness such as Botswana, Malta, Singapore and Hong Kong (to name a few) which he called miracles, at the same time there are countries with negative growth like Kuwait, Liberia, UAE (to name a few) which he called debacles.

On the local front, Baharumshah and Rashid (1999), Wong and Yip (1999) Choong, Zulkornain, and Liew (2005), did studies on determinants of growth in Malaysia, albeit using different methodology, and all of them in one way or another agrees that export is an important factor of growth, however none of them uses trade openness or total trade for the study in Malaysia. The export-led growth hypothesis is also supported by Mahadevan and Suardi (2006). Since it is a known factor that trade openness is an important variable of growth as claimed by Dexter, Levi and Nault (2005), we replaced the export variable with trade openness. In the survey of how large is International Trade's effect on Economic Growth which was done by Lewer and Van Den Berg (2003) reveals that many empirical studies are surprisingly consistent in terms of the size of the relationship. A percentage point increase in the growth of exports is associated with a one fifth percentage point increase in economic growth. Given the power of compounding, the effect is very important for human welfare.

## 4.0 METHODOLOGY

### 4.1 The Economic Growth Model

In this study, the real per capita Gross Domestic Product (RGDPC) growth is used as a measurement of economic growth. (dependant variable) with the trade openness (TOP), real effective exchange rate (REER), real foreign direct investment (FDI) as the independent variables. An autoregressive distributed lag (ARDL) model, more explicitly bounds test approach as introduced by Pesaran *et al* (2001) is used to test and examine the variables.

$RGDPC_t = f(FDI_t, TOP_t, REER_t)$  or more explicitly stated as unrestricted error correction model (UECM) as below:

$$\Delta RGDPC_t = \beta_0 + \beta_1 RGDPC_{t-1} + \beta_2 FDI_{t-1} + \beta_3 TOP_{t-1} + \beta_4 REER_{t-1} +$$

$$\sum_{i=1}^a \beta_{5,i} \Delta RGDPC_{t-i} + \sum_{i=0}^b \beta_{6,i} \Delta FDI_{t-i} + \sum_{i=0}^c \beta_{7,i} \Delta TOP_{t-i} + \sum_{i=0}^d \beta_{8,i} \Delta REER_{t-i} + u_t \quad (1)$$

Where the RGDP is the real Gross Domestic Product per capita, FDI is the real Foreign Direct Investment inflow, TOP is the level of openness which is the ratio of total trade (export plus import) over real GDP, Real Effective Exchange Rate (REER) and  $\Delta$  is the first difference operator.

For the examination of long- run relationship the bound cointegration test based on critical values taken from Pesaran (2001) will be used with the null and alternative hypotheses are as below:

$$H_0 = \beta_1 = \beta_2 = \beta_3 = 0 \text{ (no long-run relationship)}$$

$$H_1 = \beta_1 \neq \beta_2 \neq \beta_3 \neq 0 \text{ (a long run relationship)}$$

### 4.3 Description of sources of Data

Annual data for the period 1975-2005 was collected from the International Monetary Fund (IMF), The RGDP growth data was obtained from the first difference in the logarithm of real GDPC. The exchange rate was the real effective exchange rate (REER). For the level of openness, the export and import data was totalled and divided with GDP to obtain the index. As for the real Foreign Direct Investment (FDI), again the logarithm of the raw data obtained of the inflow of funds was used.

## 5.0 DISCUSSION OF EMPIRICAL RESULTS

A unit root test was done for the dependent variable using the Augmented Dickey-Fuller (ADF) test to satisfy the pre-requisite condition of the dependent variable being non stationary or contains a unit root in I(1) and stationary at I(0) as prescribed by Pesaran (2001).

### 5.1 Results of the Unit Root Test for the dependent variable(DF/ADF)

**Table 1 Results of the Unit Root Test for the dependent variable (DF/ADF)**

Variables	DF/ADF							
	Level				1st difference			
	Constant	k	Trend	k	Constant	k	Trend	k
GDP	-1.217339	0	-2.65439	0	-4.669541*	0	-4.534774*	0

Note : Asterisk (\*) denote statistically significant at the 5% level

<b>Table 2 The Estimated ARDL Model Based on Equation (1)</b>				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGDPC(-1)	-0.393825	0.169944	-2.317376**	0.0374
FDI(-1)	-0.031527	0.011756	-2.681797**	0.0188
TOP(-1)	0.204998	0.064705	3.168179***	0.0001
REER(-1)	0.358881	0.100932	3.168179***	0.0001
$\Delta$ ( RGDPC (-1))	0.136645	0.103827	1.316079	0.2109
$\Delta$ ( RGDPC (-2))	-0.154651	0.104036	-1.4865511	0.1610
$\Delta$ ( RGDPC (-3))	0.198913	0.154720	1.285631	0.2210
$\Delta$ (FDI)	0.025032	0.010486	2.387121**	0.0329
$\Delta$ (FDI(-1))	0.043058	0.011153	3.860542***	0.0020
$\Delta$ (FDI(-2))	0.031764	0.009159	3.467906***	0.0042
$\Delta$ (TOP)	0.470668	0.055826	8.430990***	0.0000
$\Delta$ (TOP(-3))	-0.078358	0.081059	-0.966677	0.3513
$\Delta$ (REER)	0.514488	0.072112	7.134574***	0.0000
C	-1.643440	0.482812	-3.403893***	0.0047
R-squared	0.957124	Mean dependent var	0.040620	
Adjusted R-squared	0.914248	S.D. dependent var	0.062524	
S.E. of regression	0.018309	Akaike info criterion	-4.856689	
Sum squared resid	0.004358	Schwarz criterion	-4.184774	
Log likelihood	79.56530	F-statistic	22.32311	
Durbin-Watson stat	1.425233	Prob(F-statistic)	0.000001	

$\Delta$  denotes first difference

Note : \*\*\*,\*\* and \* denote significant at 1%, 5% and 10% levels

## 5.2 Diagnostic checking

**Table 3**

AR (2) = 1.298 (0.368)	AR (4) = 4.256 (0.199)
ARCH (3) = 0.2131 (0.886)	ARCH (4) = 0.3688 (0.827)
JB = 1.048509 (0.591997)	RESET = 1.321259 (0.333693)

AR (i) for  $i = 2,4$  denote LM-type Breusch-Godfrey serial correlation and ARCH (i) is ARCH Test to test for the present of serial correlation and ARCH effect at lag i. JB is Jarque-Bera Normality Test while RESET is Ramsey Regression Specification Error Test.

For the examination of long- run relationship the Wald test (F-statistic) was calculated by imposing restrictions on the estimated long-run coefficients as explained previously in this paper, we obtained a F-statistic of 4.371263 which is greater than the upper bound value, thus we can easily reject  $H_0$  and conclude that there is a long run relationship between the dependent variables and the economic growth.

### 5.3 Bounds Test for Cointegration Analysis Based on the Equation 1

Critical Value	Lower Bound Value	Upper Bound Value
1%	3.74	5.06
5%	2.86	4.01
10%	2.45	3.52

Computed F-statistics : 4.371263 (significant at 0.05 marginal level)

### 5.4 Long run Estimated Coefficient

Table 4

<i>Variable</i>	<i>Coefficient</i>
TOP	0.52053***
FDI	-0.00800**
REER	0.91127***

Note :\*\*\* and \*\* denote significant at 1 % level and 5% respectively

### 5.5 Short run estimated coefficients – Wald Test

Table 5

<i>Variable</i>	<i>Coefficient</i>
TOP	0.39231***
FDI	0.09985***
REER	0.51448 ***

Note :\*\*\* denote significant at 1 % level

The long run relationship thus can be written as below:-

$$GDP_t = -1.643440 + 0.52053 TOP_t + 0.91127 REER_t - 0.00800 FDI_t$$

The equation indicates that variables such as TOP, REER are positively related while FDI has an inverse relation. TOP's sign is concurrent with economic theories and past findings, same goes to REER sign. FDI has a negative sign in the long run as opposed in the short run, which means that Malaysia as a host country benefits from the capital injection in the short run but profit withdrawal might contribute to the long run negative sign .

Results	Similar Past Findings
TOP (Positive)	<i>Srinivasan and Bhagwati (1999)</i> <i>Sjoholm (1999)</i> <i>Bahrumshah and Rashid (1999)</i> <i>Wong and Chong (1999)</i> <i>Panagariya (2004)</i> <i>Dollar and Kraay (2004)</i> <i>Mahadevan and Suardi (2006)</i> <i>David Barlow (2006)</i>

## 6.0 Conclusion and Discussion

The result of this research shows that all the independence variables chosen, FDI, TOP, REER, significantly determine the economic growth in Malaysia for the chosen period 1975 to 2005, all the independent variables are significant both in the short run and long run. The results are concurrent with most of the literature reviewed and theoretical framework. TOP is significantly positive related to economic growth, and proves that to the most widely held beliefs in the economic profession,

Indeed, opposing the standard ("neoclassical") growth models, whereby trade openness have no impact on the long-run growth rate of an economy the results proves otherwise, that is, impact of level of trade openness on economic growth proves to be a important and significant variable in determining economic growth both in the short run as well as in the long run, positively. All the independence variables are found to be significantly stimulating growth for both the short as well as the long run except for the FDI as mentioned, stimulates growth in short run but works the opposite direction in the long run. The situation of the determinants of growth for Malaysia is found to be generally similar to most of the other nations in the world

The positively significant sign of trade openness, both in the short run and long run may also signal its impact on increasing a nation's income and, as the export-led growth hypothesis explains, that export contributes positively to economic growth by facilitating the exploitation of economics of scale, relieving the binding constraint to allow increases in the import of capital and intermediate goods enhancing efficiency through increased competition, and promoting the diffusion of knowledge through learning by doing.

The results of this study will strengthened the view that openness to trade will continue to be viewed as a key determinant of economic growth. Siding with *Sjoholm (1999)* who found that trade does not only increase a nation's productivity, it also increases the nation's technology standard through increased competitive pressure, embodiment in imports, and knowledge transfer through commercial contacts. The result is echo's *Baharumshah and Rashid (1999)* who outlined that degree of openness of a country will affect the speed of economic growth of that nation. They also quoted *Bhagwati (1988)* who brought up the third hypothesis of many studies in trade and economic growth where increased trade produce more income and more income will facilitate trade which is known to be 'virtuous cycle' .

As further supported by *Dollar and Kraay (2004)* who outlined that trade openness is a reasonable reason in accelerating growth as the more rapid growth may be a transitional effect rather than a shift to a different state growth rate. They also single out the TOP one-third of developing countries in terms of trade to GDP over the past 20 years. They further mentioned that expectation for greater openness would improve the material live of the poor, which in turn will to GP growth as a whole.

The results of this study is also akin to that of *Wong and Chong (1999)* who outlined that Asian countries experiencing rapid growth in the past decade are open economies which had great influences on the trade policies of many developing countries.

As for the FDI, which is found to be significant positively in the short run, this is not an isolated finding. Similar results were obtained by *Hermes and Lensink (2000)*, who found that FDI only enhance growth once a country has reached a given threshold of human capital and financial market development and for most developing this threshold has yet to be attained. *Carkovic and Levine (2001)* also share the same finding whereby the impact of the exogenous component of FDI on GDP growth is not significantly different from zero.

We would also like to suggest future empirical studies and literature on trade and growth towards identifying the exact mechanisms through which trade effects grow and not just compute the correlation.



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