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Is Foreign Direct Investment (FDI) the Cause of Malaysia's Export?

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Abstract: Malaysia is at the 25th position of world's top exporting country in 2011. Some attributed Malaysia's trade performance to openness of the country to trade and foreign direct investment (FDI). In this regard, FDI inflow to Malaysia was massive and some have linked the country's export performance to FDI inflow. This paper attempts to analyze the causality of FDI on Malaysia's export by looking into data from 1970 to 2010. Here the Granger Causality Test is performed to have an econometric assessment to determine whether FDI have causality on Malaysia's export. The study result reveals that there is a long run relationship between FDI and Malaysia's export and FDI does granger cause Malaysia's export. Hence, policies which attract FDI should be implemented for a sustainable inflow of investment.

Key words: Export, Foreign Direct Investment (FDI), Malaysia, Causality

INTRODUCTION

Malaysia is reported to be the 25th largest exporting nation in 2011 (WTO, 2012) from 43rd in 1980. Some have attributed Malaysia's trade performance to trade openness (Ariff, 2008; WTO, 1997; WTO, 2006; Rafiq, 2010).

There are many reasons which economists have pointed out as reasons explaining performance of import and export. Some studies like Blake, A., and N. Pain (1994) and Cabral, L. (1995) have emphasized that foreign direct investment have positive effects on export. For the case of Malaysia, foreign direct investment is believed to play vital role in explaining its export performance. The study of Alias Mat Derus, Ai-Yee, Ooi, Mohd Fahmi Ghazali and Siti Hajar Samsu (2008) states that FDI inflows and exports are cointegrated.

This paper aims to analyze the causal relationship between Foreign Direct Investment (FDI) and export looking from Malaysia's experience over the period 1970 to 2010. Stationary test using Augmented Dickey-Fuller and Phillip-Perron test are undertaken to check whether the time series are stationary or not. Then, an Engle-Granger 2 Step Algorithm test is undertaken to check whether they are cointegrated. Finally, Granger Causality test is undertaken to check the causal relations between FDI and export. The paper's findings suggest that FDI inflows and exports are cointegrated which implies that there was a long term relationship between them and there is a causal relations from FDI on export. Section two gives the study methodology. Section three presents the study results. The final section gives concluding remarks.

MATERIALS AND METHODS

Data:

In this study, I used annual data of FDI from World Bank website (World Bank, 2011) and data of Malaysia's export from United Nations Commodity Trade Website (United Nations, 2011) from period 1970 to 2010 (40 years observation).

Tests for Stationarity:

In order to use and test the time series data that I am using in this study, it is vital to check for stationarity of variables in the model. The time series data which are going to be used in the model requires a test to check the existence of unit root. Unit root test is undertaken on each variable to ensure they are integrated (Gujarati, D. and Porter D., 2009). Verily, the used of non stationary series could result in spurious regression (Gujarati, D. and Porter D., 2009). In this regard, I will conduct the Augmented Dickey Fuller (ADF) test. Thus, here I estimate by including a number of the lagged values and the ADF test is based on the regression equation with the inclusion of a εεconstant and a trend in the form of:

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

where X_t = variables of interest in the logarithm forms at time trend t, ΔX_{t-I} expresses the first differences with k lags and ε is the white noise residual of zero mean and constant variance. The coefficients $\{\beta_0, \delta, \mu_t, \alpha_1 \ldots\ldots \alpha_k\}$ are those parameters being used to estimate. The null and the alternative hypothesis for the existence of unit root in variable X_t are as follows:

$H_0 : \delta = 0$ (X_t is non-stationary or contains a unit root)

$H_1 : \delta < 0$ (X_t is stationary or does not contain unit root)

Null hypothesis of the unit root test refers to series which are non stationary. If the estimated value for δ is less than zero, the null hypothesis δ = 0 will be rejected. Hence, the series is considered stationary. However, if the null hypothesis is true, this indicates that the time series have a unit root process. In general, normally, it is likely to be stationary in the first differences as depicted in the studies of Dipendra Sinha (1999) and James H.S. and Mark W.W. (1998).

After performing the ADF test, I will conduct Phillip-Perron (PP) test, by which I use the following equation:

$$\mathbf{\Delta y_t} = \delta \mathbf{y}_{t-1} + \mu_t \quad (2)$$

PP test is used due to its ability of making correction to the t-statistics of the coefficient from the Autoregressive of order one (AR (1)) regression to account for serial correlation. The PP test is a test of the hypothesis δ = 0 (null hypothesis) and its alternative when δ is less than zero. In PP test, there are no lagged difference terms. Indeed, the equation is estimated by OLS and then the *t*-statistics of the *p* coefficient is corrected for serial correlation in ε_t.

In the two methods mentioned above, the unit root hypothesis corresponds to the null hypothesis. If we are unable to reject the presence of a unit root, the series may be integrated of order one. Thus, first difference will be made. Once both are stationary then we can proceed with the next tests.

Test for Cointegration (Engle Granger 2 Step Algorithm):

Cointegration test is undertaken to test on the long run and equilibrium relationship between variables. If both time series are non-stationary after being differenced, it indicates that the time series are not cointegrated, thus we will not proceed with the cointegration test. However, if both series become stationary after first difference, cointegration test will be undertaken. To determine whether the series are cointegrated or not I will conduct the Engle Granger 2 Step Algorithm test. Engle-Granger 2 Step Algorithm is the basic procedure which is used to test for cointegration with a single equation model and a single cointegrating relationship (Engle and Granger, 1987). In this test, residual series are being made, ADF test being performed. Once the series are proven to be cointegrated, I can proceed with the next test which is the Granger Causality test.

Test for Causality (Granger Causality):

The next step involved is testing for Granger causality among the variables. I thus proceed with causality test using the first difference version of the variables under study. The study further explores the relationship between the series by using Granger-Causality test to test for the bivariate equation. Granger (1988) points out that if two series are cointegrated, then there must be Granger-causation in at least one direction. A variable X_t Granger causes Y_t, if Y_t can be predicted with better accuracy by using past values of X_t with other factors held constant. The Granger causality test involves estimation of the following model:

$$Y_t = \Delta y_t = \mu_t + \sum_{i=1}^{p} \alpha_i Y_{t-i} + \sum_{j=1}^{q} \beta_i X_{t-i} + \varepsilon_t \quad (3)$$

Where u_t denotes the deterministic component and ξt is white noise. The null hypothesis can be tested using *F*-test. When the *p*-value is significant, the null hypothesis of the *F*-statistic is accepted, which implies that the first series does not Granger-causes the second series and vice versa.

RESULTS AND DISCUSSION

Stationarity Test:

The result shown in table 1, panel A, below indicates that the time series contain unit root (at 1% critical value), hence not stationary. However, under ADF test, only log FDI (with trend) is stationary at 5% critical value, and under PP test only log export (without trend) is stationary at 10% critical value.

Besides, after first difference being made, both series become stationary. As depicted in table 1, panel B, in both ADF and PP tests, log export (LX) and log FDI (LFDI) become stationary at 1% level of significance (both with intercept only and with intercept and trend) with exception for log FDI where it becomes stationary at 5% level of significance (for ADF Test only). To sum up, the time series used under study are all stationary after first difference.

Table 1: Augmented Dickey Fuller (ADF) and Philips Perron (PP) tests for unit roots.

Panel A	Test for I (0) Levels			
	Tμ (Without trend)		T_t (With trend)	
Variables	ADF	PP	ADF	PP
LFDI	-2.156870	-2.156870	-3.659478**	-3.591862
LX	-1.795182	-2.711432*	-2.008125	-1.803175

Panel B	Test for I (1) First difference			
	Tμ (Without trend)		T_t (With trend)	
Variables	ADF	PP	ADF	PP
LFDI	-3.689291***	-8.418855***	-3.840718**	-8.398953***
LX	-5.810689***	-5.811165***	-6.232696***	-6.361278***

Notes: Number in the table are the t-statistics for testing the null hypothesis that the variables non stationary or has a unit root.
*, **, *** indicate the significance level of 10%, 5%, and 1% respectively.

Tests for Cointegration (Engle Granger 2 Step Algorithm):

After residual series is being made, and the ADF test is being performed for both with intercept only and with intercept and trend, it is vivid that absolute value is greater than the critical value at 1% level of significance (refer table 2 below). It implies that there was a long term relationship between FDI and export of Malaysia over the period under observation. All in all, based on the Engle Granger 2 Step Algorithm procedure and test, it implies the time series are cointegrated.

Table 2: Tests for Cointegration (Engle Granger 2 Step Algorithm).

Unit Root Test (for residual)	
Tμ (Without trend)	T_t (With trend)
ADF	ADF
-8.747362***	-8.608508***

Notes: *, **, ***indicate the significance level of 10%, 5%, and 1% respectively.

Test for Granger Causality:

In studying the causal relationships as well as directions of the series, I run the Granger causality test. The results of Granger-causality test as reported in Table 3a and 3b below indicates that there is one causal effect running from FDI to Malaysia's exports at 1% significance level. It implies that the log FDI (LFDI) does Granger Cause log Malaysia's export (LX) (reject the null hyphotesis). The causality test also shows that there is no one-way causal effect running from Malaysia's export to FDI inflow. It implies that log export (LX) does not Granger Cause log FDI (LFDI) (accept the null hyphothesis).

Table 3a: Granger Causality Tests.

Sample: 1970 2010			
Null Hypothesis:	Obs	F-Statistic	Prob.
LX does not Granger Cause LFDI	40	10.1377	0.0029
LFDI does not Granger Cause LX		0.45810	0.5027

Table 3b: Granger Causality Tests.

Null Hypothesis	F-Statistics	P-value	Conclusion (Hypothesis)
LX does not Granger Cause LFDI	10.1377	0.0029	Accept
LFDI does not Granger Cause LX	0.4581	0.5027	Reject

Hence, effort in attracting FDI inflow through the implementation of viable policies need be intensified to have a sustain export performance. However, the result of the study does not claim that FDI is the only reason which could explain the export performance of a country. There are many instances under different studies using different models which explain that other variables could contribute to the export performance of a country.

Conclusion:

Export and foreign direct investment (FDI) contributed greatly to Malaysian economy. The main findings of this study is that there is a causal relationship from FDI to export and the FDI inflows and exports were cointegrated in the period between 1970 to 2010. Besides, it indicates that there was a long term relationship between export and FDI. This indeed similar and confirm an earlier study by Alias Mat Derus, Ai-Yee, Ooi, Mohd Fahmi Ghazali and Siti Hajar Samsu (2008). As for policy implication, it is obvious that the government

should multiply its effort in attracting more FDI into the country by implementing policies which are conducive for investment to come. Indeed, an increase in FDI would lead to an increase in export.

REFERENCES

Alias Mat Derus, Ai-Yee, Ooi, Mohd Fahmi Ghazali and Siti Hajar Samsu, 2008. Causal Links between Foreign Direct Investment and Exports: Evidence from Malaysia. International Journal of Business and Management, 3(12), December 2008.

Ariff M, 2008. Economic openness, volatility and resilience: Malaysian perspective. Malaysian Institute of Economic Research, Kuala Lumpur.

Blake, A., N. Pain, 1994. Investigating structural change in U.K. Export Performance: the role of innovation and direct investment. Discussion Paper No. 71, National Institute of Economic and Social Research (NIESR).

Cabral, L., 1995. Sunk costs, firm size and firm growth. Journal of Industrial Economics, 43: 161-172.

Dipendra Sinha, 1999. Export instability, investment and economic growth in Asian countries: a time series analysis. Centre discussion paper no. 799, Economic Growth Centre, Yale University.

Engle, R., C. Granger, 1987. Co-integration and error correction: representation, estimation, and testing. Econometrica, 55(2): 251-276.

Granger, C.W.J., 1988. Some recent developments in a concepts of causality. Journal of Econometrics, 39(1-2): 199-211.

Gujarati, D., D. Porter, 2009. Basic Econometrics. Fifth edition, McGraw-Hill.

James, H.S., W.W. Mark, 1998. Business cycle fluctuations in U.S. economic time series. Working Paper 6528, NBER Working Paper Series.

Rafiq Idris, 2010. Trade Openness in Malaysia. Master's of Applied Economics (I) Dissertation (University of Adelaide), unpublished.

United Nations, 2011. Data for Malaysia's export is obtained from United Nations Commodity Trade website in November 2011.

World Bank, 2011. Data for foreign direct investment (FDI) is in November 2011, from: http://data.worldbank.org/indicator.

World Trade Organization (WTO), 1997 WTO, Trade Policy Review 1997: Malaysia. Retrieved in October 2009 from: http://www.wto.org/english/tratop_e/tpr_e/tp67_e.htm.

World Trade Organization (WTO), 2006. WTO, Trade Policy Review 2006: Malaysia. Retrieved in Jun 2010 from: http://www.wto.org/english/tratop_e/tpr_e/tp257_e.htm.

World Trade Organization (WTO), 2012. Trade growth to slow in 2012 after strong deceleration in 2011. Press release 2012, retrieved in August 2012, from: http://www.wto.org/english/news_e/pres12_e/pr658_e.htm