



Market Size and Export-led Growth Hypotheses: New Evidence from Malaysia

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ABSTRACT

Exploring the causal relationship among exports, foreign direct investment (FDI) and economic growth is of enormous importance for the policy implications the causal process among the variables assume. The relevance of investigating the causal relationship between inward FDI and exports borders on the implications of the choice between outward oriented policy and inward looking policy. Utilizing data on Malaysia spanning 1970-2012, this study explores the relationships as well as causal interactions among economic growth, exports and FDI employing vector autoregression model and Toda and Yamamoto (1995) augmented causality test. Results from impulse response function (IRF) analysis shows that both real gross domestic product (GDP) and real FDI have increasing trend of percentage shocks in them causing fluctuations in the real exports over the period of 5-year. However, real exports was found to have dominance of own shock over the period of analysis. Similarly IRF of real FDI shows that flections in the variable are dominated by variations in its own values. However, both real exports and real FDI were found to have significant effect in determining fluctuation in real FDI with real GDP having stronger effect. Finally, we observe very significant effect on fluctuations in real GDP of real FDI and exports. Over the course of 5 years, it was observed that real FDI and exports dominate fluctuations in the real GDP more than its own shock. Results from the study indicate presence of bi-directional causality between exports and inward FDI. On the causal link between exports and GDP, the study finds evidence of uni-directional causality running from GDP to exports, affirming growth-led exports hypothesis. The study also provides evidence that market size hypothesis holds for Malaysia, as evident by one-way causality from GDP to FDI.

Keywords: Growth-led Exports Hypothesis, Market Size Hypothesis, Exports, Foreign Direct Investment, Real Gross Domestic Product, Malaysia

JEL Classifications: F4, O47

1. INTRODUCTION

Achieving and sustaining economic growth is at the forefront of the objectives that every economy strives to achieve. It is therefore against this background that issues revolving around growth and its determinants have attracted tremendous attention from researchers and policymakers. Of the commonly mentioned determinants of growth is foreign direct investment (FDI). However, it has been observed that the size of country's gross domestic product (GDP) plays a very significant role in determining the inflow of FDI from foreign. The proposition is what is termed as "market size hypothesis." Succinctly, the hypothesis considers FDI inflows into an economy to be an increasing function of its market size (commonly measured using GDP). In other words, the hypothesis maintains that foreign investors on the whole tend to favour economies with high GDP when making decision on the location

of their investments. Contrary to the proposition of market size hypothesis, some studies (Edwards, 1990; Jaspersen et al., 2000) have found no significant impact of GDP on FDI. However, such findings are justified from the view point that not all forms of FDI are directed towards serving domestic market. Some investment decisions are taken not to serve the immediate market of operation of multinational, rather to provide such multinationals with an easy access to other regional markets. Under such circumstances, FDI can be found not be increasing function of host economy's market size (Asiedu, 2002).

Another commonly scrutinized output related hypothesis is export-led growth (ELG) hypothesis. In plain terms, the hypothesis deals with the link between exports and output growth. Results from studies on the test of validity of ELG hypothesis are far from unanimous. Whereas some studies found no causality at all

between the variables (Yamada, 1998; Thangavelu and Rajaguru, 2004), other have found the hypothesis to be valid (Shan and Sun, 1998; Awokuse, 2005; Ozturk and Acaravci, 2010, Uddin et al., 2013; Tang et al., 2015). At the other end some researchers have found that the effect runs from economic growth to exports (Panas and Vamvoukas, 2002).

Malaysian economy has on the whole been performing considerably well. Numerous studies have linked such achievement recorded by the Malaysian economy to the increased FDI inflows achieved and maintained by the economy since 1980s (Ang, 2008). Policy reforms, such as Investment of Act introduced in 1968 and increased openness adopted in the 1980s have been identified as the possible reasons for the increased inflow of FDI into Malaysia. Policy efforts aside, Malaysian economy is characterised by sound macroeconomic environment, sustained output growth and solid financial system have attributed to increased flow of FDI into the economy.

Moreover, Malaysian export sector has witnessed significant changes both in terms of growth and composition of commodities over the recent five decades. Malaysian economic industrialization policy can be regarded as a success for a couple of reasons. One, as Ghatak et al. (1997) notes, since 1987, the exports sector of the economy witnessed changes in the composition of products. During 1960s, the composition of Malaysian exports is characterized by the dominance of agricultural and mining products. However, during the 1990s, manufacturing sector witnessed tremendous growth to the extent that it accounts for over 80% of the total exports of Malaysian economy. The sector maintains this contribution up to date (Bank Negara Malaysia, 2014). Two, beside the drastic shift in the composition of the exports in favour of manufactured goods, Malaysian economy registered moderate growth in its level of exports. For instance, between 2006 and 2010, the economy achieved an average annual export growth of 5.5% despite a significant fall of exports by about 20% during 2009 (United Nations, 2013).

Given such development in the economic history of Malaysia, this study would examine; the causal link among GDP, exports and FDI in Malaysian economy; and relationship between GDP, exports and FDI. The rest of the paper is structured into five. In section two we provide a discussion on the inter-relationship among the variables of interest from conceptual point of view. Section three respectively accommodates review of empirical literature on the relationship among the variables. Section four describes our data and outlines the methodology employed by the study. Before concluding the paper in section six, we discuss our empirical results in section five.

2. RELATIONSHIPS AMONG EXPORTS, FDI AND GDP

The causal links between FDI and exports on one hand and economic growth on the other have been largely investigated. ELG hypothesis and market size hypothesis are commonly used as the basis for such studies. Market size hypothesis suggests

that inward FDI is a function of host country's market size. Since international investors are strategically and economically rational, they only opt for investing in an unfamiliar foreign environment if they predict return on sales higher than their various operating expenses. However, the fact that economy of scale depends on the market size, the decision of international investors depends on the market size of the hosting economy for it determines the economy of scale and by extension returns on investments (Wei and Liu, 2001). Prominent among pioneer studies on the link between market size and inward FDI include Scaperlanda and Mauer (1969), Dunning (1973), Agarwal (1980), Davidson (1980), Nigh (1985), Terpstra and Yu (1988). The principal implication of this hypothesis is that causality runs from GDP (as a measure of market size) to inward FDI. Conversely, it can be argued that inward FDI precedes economic growth. This argument resides on the belief that, besides its role of complementing domestic private investment, FDI serves as an important avenue for technology transfer and creation of new employment opportunities in the host economy (Xu, 2000; Ciruelos and Wang, 2005; Bijsterbosch and Kolasa, 2010).

As highlighted above, ELG provides basis for the empirical studies on the relationship as well as causal link between exports and economic growth. Kravis (1970) stresses on the obvious positive correlation between exports and output growth owing to the fact that exports form a component of aggregate output. To mention a few, initial and famous studies on the relationship between exports and economic growth include Michalopoulos and Jay (1973), Michaely (1977), Heller and Porter (1978), Feder (1982) and Chow (1987). ELG has been justified in the literature from several dimensions. Economies that adopt exports promotion policies could benefit from exploitation of economies of scale, better capacity utilization to meet up with international demand and resource allocation according to comparative advantage. Other beneficial aspects attributable to exports promotion are technological improvement induced by exposure to international market competition pressure and creation of more employment opportunities in the case of labour-surplus economies (Balassa, 1978). The implication of ELG is that causality runs from exports to GDP. Other side of the debate on the causality between exports and economic growth is growth-led export (GLE) – causality running from economic growth to exports expansion. Consider an economy experiencing rapid production growth in few industries resulting from factors such as accumulation of production experience, human capital accumulation and technology transfer, possibly resulting from FDI. In such an economy, experiencing unbalanced growth, it is unlikely for the domestic demand for the products of booming industries to match the production growth in the industries. As a consequence, producers may opt for foreign markets, thereby leading to exports expansion (Jung and Marshall, 1985).

Studying the causal link between FDI and exports has a significant policy implication as it borders on the choice between outward oriented policy and inward looking policy. Having established the possible channels through which each of the exports and FDI are linked economic growth, we now direct our discussion towards establishing possible links between the exports and FDI.

The argument that causality runs from exports growth to inward FDI may rely on the question of efficiency. Zhang and Felmingham (2001) argue that export-oriented domestic firms are exposed to international competition pressure and as a result tend to be more disciplined, innovative and efficient, a situation that in turn makes them more profitable and by implication more attractive to foreign investors. The authors further justify the case of causation from exports to FDI from the supply point of view. The fierce competition pressure resulting from international trade may lead to increase in the level of productivity of host country's exports sector. Increase in the productivity may manifest either in the reduction in the cost associated with capital utilization or high-priced differentiated products in international market. Given the obvious inverse relationship between cost and rate of return, foreign investors are bound to be attracted to make investment in such an economy with lower cost.

The other side of the causation is the case of inward FDI leading to exports expansion of the host economy. According to Zhang and Song (2000), the impact of FDI on exports of host economy can be divided into direct and indirect. Multinational corporations generally have wider coverage of business contacts, superior technology and marketing skills and expertise than local firms. Therefore foreign affiliates have better exports potentials than domestic firms and are therefore more capable of boasting exports of the host country. This effect of inward FDI on exports of the host country is considered as direct effect. On the other hand, indirect effect of presence of foreign affiliates in a host economy can be seen from view point of domestic firms learning by observing the exports activities of foreign affiliates. Another indirect effect of FDI on the host economy could be that domestic firms may become more efficient as a result of competitive pressure of foreign affiliates, which may in turn increase their productivity and thus exports performance.

Having reasonably provided some highlights on the possible channels of interaction among the variables of interest to the study, with the view to establishing grounds for our empirical analysis, review of related literature is made in the subsequent subsection. Setting boundaries for our review of literature at the onset is important. For examining the causal link among exports, FDI and GDP is the main objective of this study, our review of literature focuses only on the causality related studies.

3. CAUSALITY AMONG EXPORTS, FDI AND GDP

Causation between FDI and economic growth has been largely investigated using data from both developed and developing countries. Such studies have generated conflicting results on the direction of the causality between inward FDI and GDP. Ericsson and Irandoust (2001) investigates the causal relationship between growth in real GDP per capita and rate of changes in inward FDI flows for a sample of four European economies – Denmark, Finland, Norway and Sweden. The authors find evidence of one-way causality from FDI to economic growth in Norway and bidirectional causality between the variables in the case of Sweden.

However, the authors find no evidence in support of any causal link between FDI and economic growth in the case of Denmark and Finland. In a related study, Dritsaki et al. (2004) report evidence of one-way causation from FDI to GDP in Greece.

Moreover, a host studies were also conducted utilizing data mainly on developing economies. Such studies as well produced mixed finding on the direction of causation between FDI and economic growth. For instance, Shan et al. (1999) delve on the causal link between FDI and GDP in China. The researchers find evidence of two-way causality between the variables, a finding that Shan (2002) supports. Shan (2002), however, further find that the effect of output on FDI is much stronger than that of FDI on output, suggesting imbalance in the strength of the causality between the variables. Zhang (2001) also reports mixed findings regarding causal link between GDP and FDI on a sample of 11 developing economies drawn from East Asia and Latin America. Results from the study show that only in one case that evidence of no causation between FDI and GDP is found. As for the remaining 10 cases, there is evidence of unidirectional causality from FDI to GDP in eight cases and feedback causation in the remaining two. A related study on was also carried out by Basu et al. (2003). Employing panel cointegration and causality test, the authors report evidence of feedback causation between FDI and economic growth among a sample of 23 developing countries. Using data on a panel 31 developing economies, Hansen and Rand (2006) provides evidence in support of long run causality from FDI to GDP. Chowdhury and Mavrotas (2006) examine the causal link between FDI and output in Chile, Malaysia and Thailand over the course of 1969-2000. Results from the study show that causality runs from GDP to FDI in the case of Chile and two-way causality in Malaysia and Thailand. In a recent study, Tekin (2012) examines a sample of least developed economies for the period spanning 1970 and 2009. The author reports evidence of unidirectional causality from FDI to GDP in Benin and Togo. On the contrast, the study finds evidence of reverse causality from GDP to FDI in a group of four countries – Burkina Faso, Gambia, Madagascar and Malawi.

Employing varying econometric tools on data from both developed and developing counties, researchers have exposed causality between exports and GDP to a very rigorous scrutiny. Such studies generate contradicting findings on the direction of the causality between exports and GDP. An extensive survey of studies on the causal link between exports and economic growth is provided in Giles and Williams (2000).

Jung and Marshall (1985) is one of the pioneer and famous works that investigates the causal relationship between exports and economic growth. Using Granger causality test on each of the 37 developing economies the study covers, the authors report evidence in favour of export promotion preceding economic growth only in four cases – Indonesia, Egypt, Costa Rica and Ecuador. Related study was carried out by Chow (1987) using Sims (1972) procedure for a sample of eight newly industrialised economies. Results from Chow appear contradict Jung and Marshall. The study reports evidence of unidirectional causality from exports to economic growth only in one case, with bi-directional causality from output growth to exports in six cases. Only in one case the

researcher detects absence of causality between the variables. Findings from Ahmed and Kwan (1991) and Dodaro (1993) appear to affirm those of Jung and Marshall.

Ahmed and Kwan (1991) find no evidence in support of causality from exports to economic growth in their study on a sample of 47 developing African economies. In contrast, the authors observe weak causality from economic growth to exports for a sub-sample of countries. Similarly, Dodaro (1991) reports weak causation between exports and economic growth in a very large sample of developing economies.

Nearly all the pioneer studies on the causal link between exports and GDP or economic growth were carried out mainly using Granger (1969) and Sims (1972) procedures. However, a host of recently studies were carried out using alternative and more robust econometric tools. Such studies also produce contradicting findings on the direction of causality between the variables. Shan and Sun (1998) explores causality between exports and economic growth using data on China for the period 1987-1996. Employing Toda and Yamamoto (1995) procedure, results from the study indicate bi-directional causality between exports and real industrial output in China. Awokuse (2005) conducted a study similar to that of Shan and Sun on Korea for the period 1963-2001. Making use of both vector error correction modelling (VECM) approach proposed in Toda and Philips (1993) and Toda and Yamamoto, the study provides support for the findings reported in Shan and Sun (1998) of bi-directional causality between export and economic growth.

Similarly, both Yamada (1998) and Thangavelu and Rajaguru (2004) examine causality between exports and labour productivity using different sample of countries. In Yamada (1998), Toda and Yamamoto (1995) procedure was employed on a sample of six developed economies – Canada, France, Italy, Japan, UK and US. The author argues that there is no evidence that causality runs from exports to economic growth among developed countries. On the other hand, Thangavelu and Rajaguru (2004) carried out their study on Hong Kong, Indonesia, Japan, Taiwan and Thailand. Results from vector error-correction modelling lead the authors to the conclusion that there is no causal effect from exports to labour productivity growth in the sampled economies. Similarly, Panas and Vamvoukas (2002) employ error-correction modelling and multivariate Granger causality to examine the link between exports and output growth in Greek economy. Results from the study suggest one-way causality from output to exports. In their recent study, Balcilar and Ozdemir (2013) investigate the export-GDP nexus for Japan. Taking into cognisance time variation using bootstrap Granger non-causality test and rolling estimation, the researchers discover no causal link between the variables. In contrast to the outcome of standard Granger causality test, results from modified Granger causality test, which is also based on bootstrap, on the full sample show evidence of feedback causality between exports and real GDP. Acaravci and Ozturk (2012) provide a survey of the literature on FDI, export and growth, and empirically investigates the causal relationship between economic growth, export and FDI for the 10 transition European countries (Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic and Slovenia). The ARDL

bounds testing approach is used to investigate the existence of long-run relationship between FDI, export and economic growth for these countries. These causality results reveal that there is causal relationship between FDI, export and economic growth in four out of ten countries considered.

4. DATA AND METHODOLOGY

The study utilizes data on Malaysia spanning 43 years, 1970-2012. Data on GDP and FDI net inflows were obtained from UNCTAD database. Both series are measured in constant 2005 USD. Data on exports for Malaysia is available on UNCTAD database only from 1980. As a result, we resort to data on exports provided by the Malaysian Department of Statistics. The Department provides exports data in local currency unit at current prices. Using annual average real effective exchange rate available on the IMF International Financial Statistics and GDP deflator from World Development Indicators, exports series was converted to constant 2005 USD. Data on FDI inflows was also converted to constant 2005 prices.

Employing Toda and Yamamoto (1995) to examine causal relationship among any set of variables involves two major stages – determining the order of integration of each series and estimating the vector autoregression (VAR) model. Both stages – determining the order of integration of a variable as well as estimating the VAR model – further require making decision on the number of lags to be included in performing the estimation. In determining the order of integration of the variables augmented Dickey–Fuller (ADF) test was employed using Schwarz information criterion to select the number of lags. As for the VAR model, we based our choice of lags on Akaike information criterion (AIC).

Toda and Yamamoto (1995) procedure estimates a VAR ($k + dmax$), where k is the lag length and $dmax$ is the maximum order of integration. The procedure uses modified Wald test for restriction on parameters on the VAR model. The test has an asymptotic chi-square distribution. This study therefore follows Ericsson and Irandoust (2001) to set up the following VAR model:

$$\begin{bmatrix} REXP_t \\ RFDI_t \\ RGDP_t \end{bmatrix} = \beta_0 + \sum_{i=1}^k \left\{ \beta_i \begin{bmatrix} REXP_{t-i} \\ RFDI_{t-i} \\ RGDP_{t-i} \end{bmatrix} \right\} + \sum_{j=k+1}^{dmax} \left\{ \beta_j \begin{bmatrix} REXP_{t-j} \\ RFDI_{t-j} \\ RGDP_{t-j} \end{bmatrix} \right\} + \begin{bmatrix} \varepsilon_{REXP} \\ \varepsilon_{RFDI} \\ \varepsilon_{RGDP} \end{bmatrix}$$

Where, β_0 is a 3×1 vector of intercept terms, β_1 to β_{dmax} are 3×3 matrices of coefficients and ε is the vector of error terms. Toda and Yamamoto (1995) Granger non-causality tests the following null hypothesis:

$H_0: R\beta = r$, where R is an $(N \times (3 \cdot k + 3))$ matrix of rank N , r is an $(N \times 1)$ null vector, N is the number of restrictions of the estimated coefficients and $\beta = \text{vec}(B_0, \dots, B_k)$.

5. EMPIRICAL RESULTS

ADF test for unit root was carried to determine the order of integration for each of the three variables involved in the study. The purpose of this test is to determine the maximum of order of integration among the variables of interest. Results from the test are presented in Table 1.

As can be observed from Table 1, the test was carried out both assuming only a constant as well as a constant and trend. As the Table 1 shows, in both the cases, null hypothesis that a variable has unit root cannot be rejected at level values of each of the series. Conversely, in all the cases we can reject the null hypothesis at first difference of the series. This therefore leads us to the conclusion that the maximum order of integration among the variables is 1 and the variables are also integrated of the same of integration, $I(1)$.

Table 2 contains results of Toda–Yamamoto modified Wald test. As the Table 2 shows, the study tests a total of six hypotheses. Our VAR model was estimated using six lags – five lags selected by AIC and one lag accounting for the maximum order of integration among the variable.

Reading from Table 2, it can be observed that the null hypothesis of no causality is rejected in only two cases – causality from exports to real GDP and causality from FDI to real GDP. However, in the case of causal relationship between exports and FDI, the null hypothesis of no causality is rejected at 5% level of significance in either case – causality from export to FDI and *viz.* Similarly, the null hypothesis of no causality running from each of FDI and exports is rejected at 5% significance level.

The study also utilizes impulse response function (IRF). Results for IRF analysis are provided in Table 3. Results from IRF analysis show

Table 1: ADF unit root test

Variable	Level		First Difference	
	Constant	Constant+Trend	Constant	Constant+Trend
<i>REXP</i>	-1.19 [0.67]	-1.86 [0.66]	-4.57 [0.00]**	-4.5248 [0.00]**
<i>RFDI</i>	-2.18 [0.22]	-3.27 [0.09]*	-6.96 [0.00]**	-6.88 [0.00]**
<i>RGDP</i>	4.00 [1.00]	-0.21 [0.99]	-4.67 [0.00]**	-6.63 [0.00]**

* and ** indicate rejection of null hypothesis 1% and 5% levels of significance, P values in parenthesis. GDP: Gross domestic product, FDI: Foreign direct investment, ADF: Augmented Dickey–Fuller

Table 2: Causality test results

The null hypothesis	Modified Wald test statistic	P value	df
$REXP \nrightarrow RFDI$	22.28	0.00*	5
$RFDI \nrightarrow REXP$	19.76	0.00*	5
$REXP \nrightarrow RGDP$	8.81	0.11	5
$RGDP \nrightarrow REXP$	14.91	0.01*	5
$RFDI \nrightarrow RGDP$	8.80	0.12	5
$RGDP \nrightarrow RFDI$	11.61	0.04*	5

The notation $y \nrightarrow x$ indicates that y does not Granger cause x, * indicate rejection of null hypothesis at 5% significance level of significance, df abbreviation for degrees of freedom. GDP: Gross domestic product, FDI: Foreign direct investment

that both real GDP and real FDI have increasing trend of percentage shocks in them causing fluctuations in the real exports over the period of 5-year. However, real exports was found to have dominance of own shock over the period of analysis. Similarly IRF analysis of real FDI shows that flections in the variable are dominated by variations in its own values. However, both real exports and real FDI were found to have significant effect in determining fluctuation in real FDI with real GDP having stronger effect. Finally, we observe very significant effect on fluctuations in real GDP of real FDI and exports. Over the course of 5 years, we note real FDI and exports dominating flotation in the real GDP more than its own shock.

Results for the estimations of the VAR model are presented in Table 4. Results were estimated using ordinary least squares. As the Table 4 shows, results for three lags of the variables are reported.

For the first equation, where the *REXP* is the dependent variable, it can be observed that the only the one-period lags of real exports

Table 3: Impulse response analysis of estimated the VAR model

Period	<i>REXP</i>	<i>RFDI</i>	<i>RGDP</i>
Panel A: Response of <i>REXP</i> to shocks in itself, <i>RFDI</i> and <i>RGDP</i>			
1	3.61 (0.41)	0.00 (0.00)	0.00 (0.00)
2	4.38 (0.84)	0.53 (0.77)	1.87 (0.78)
3	3.75 (1.07)	1.20 (1.21)	0.51 (1.11)
4	1.67 (1.28)	2.60 (1.48)	2.17 (1.17)
5	2.23 (1.39)	1.46 (1.61)	3.05 (1.32)
Panel B: Response of <i>RFDI</i> to shocks in itself, <i>REXP</i> and <i>RGDP</i>			
1	-5.63 (1.75)	10.01 (1.15)	0.00 (0.00)
2	-3.8 (2.33)	8.02 (2.41)	0.76 (2.40)
3	1.47 (3.01)	6.60 (3.35)	10.25 (3.01)
4	-3.99 (3.25)	3.97 (3.74)	3.88 (3.38)
5	-5.62 (3.48)	8.62 (3.87)	-3.57 (3.72)
Panel C: Response of <i>RGDP</i> to shocks in itself, <i>REXP</i> and <i>RFDI</i>			
1	-1995.2 (498.21)	2090.33 (371.94)	1752.79 (201.06)
2	-2208.85 (766.59)	2761.30 (741.30)	845.94 (711.37)
3	-1184.67 (1040.83)	3412.41 (1123.84)	2358.72 (962.41)
4	-843.55 (1206.39)	2910.37 (1392.06)	2350.91 (1091.13)
5	-1826.68 (1329.56)	4073.50 (1532.87)	745.80 (1213.61)

GDP: Gross domestic product, FDI: Foreign direct investment, VAR: Vector auto regression

Table 4: Estimated VAR model

Independent variables	Dependent variable		
	<i>REXP</i>	<i>RFDI</i>	<i>RGDP</i>
<i>REXP</i> _{<i>t</i>-1}	1.423 (0.227)***	-0.513 (0.688)	-166.87 (177.716)
<i>REXP</i> _{<i>t</i>-2}	-0.556 (0.380)	2.326 (1.153)**	543.309 (297.807)*
<i>REXP</i> _{<i>t</i>-3}	-0.005 (0.271)	-2.566 (0.820)***	-418.741 (211.909)*
<i>RFDI</i> _{<i>t</i>-1}	-0.100 (0.094)	0.548 (0.285)*	74.208 (73.519)
<i>RFDI</i> _{<i>t</i>-2}	0.132 (0.100)	-0.770 (0.302)**	-130.958 (78.089)*
<i>RFDI</i> _{<i>t</i>-3}	-0.001 (0.064)	0.329 (0.194)*	17.249 (50.064)
<i>RGDP</i> _{<i>t</i>-1}	0.001 (0.000)*	-0.001 (0.001)	0.627 (0.355)*
<i>RGDP</i> _{<i>t</i>-2}	-0.001 (0.001)	0.005 (0.002)**	0.852 (0.504)*
<i>RGDP</i> _{<i>t</i>-3}	0.000 (0.000)	-0.004 (0.001)***	-0.412 (0.358)
C	-0.571 (1.626)	-3.167 (4.928)	981.156 (1273.011)
Adjusted R ²	0.94	0.67	0.91
N	40	40	40

Standard errors in parenthesis, ***, **, * indicate rejection of the null hypothesis that a parameter estimate is different from zero at 1%, 5% and 10% levels of significance, respectively. GDP: Gross domestic product, FDI: Foreign direct investment, VAR: Vector auto regression

and real GDP have some significant impact on the current level of real exports. Both the variables have positive impact on real exports with one-period lag of real exports being statistically significant at 1% level of significance. This compares with 10% level of significance for one-period lag of the real *RGDP*. On the other hand, real FDI was observed to be positively affected by: Two-period lag of real exports, at 5% level of significance; one-period lag of real FDI, at 10% level of significance; and two-period lags of real GDP, at 5% level of significance.

As for the real GDP, it was found to be positively affected by two-period lags of real exports at 10% level of significance. Conversely 2-year lag of real FDI was observed to have negative and significant effect on real GDP at 10% level of significance. Finally, real GDP is positively affected by one-period lag of itself at 10% level of significance.

6. CONCLUSION

The study employs a more robust methodology developed in Toda and Yamamoto (1995) in investigating the causal inter-relationship among exports, FDI and real GDP for Malaysia. The study also utilized ADF to test for order of integration of each variable involved in the study. Results emanating from the study show that there exists a bi-directional causality between exports and inward FDI in Malaysia. This finding has a far-reaching policy implication for it shows that both inward FDI and exports reinforces one another as export expansion Granger causes inward FDI and *viz.* In other words, the study finds that outward oriented policies and inward looking policies reinforces each other in Malaysia. On the causal

relationship between exports and GDP, the study finds evidence of GLEs hypothesis holding for Malaysia, as evident by uni-directional causality from real GDP to exports. Finally, our findings further indicate that real GDP Granger causes FDI, with no causality running from FDI to real GDP. The implication of this finding is that market size hypothesis is valid for the case of Malaysia.

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