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REVISITING THE DETERMINANTS OF ECONOMIC GROWTH: THE CASE OF MALAYSIA

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Abstract

This paper examines the effects of export, Foreign Direct Investment (FDI) and trade openness on the Malaysian economic growth during 1970-2013 using econometrics techniques. The results from Johansen and Juselius (1990) cointegration test signify the existence of a long-run stable equilibrium relationship among all the variables in this model. In addition, the empirical results of this study reveal that the exports and FDI are the determinants of economic growth. Out of which, real growth domestic product (GDP) is more responsive with the country's export compared to FDI. Therefore, policymakers should emphasise on human capital development which in turn enables the country to produce high-value-added products to enhance the sustainability of exports.

JEL classification codes: *F14, F43.*
Keywords: *Economic growth; FDI; Export; Trade openness; Error correction model.*

1. Introduction

Foreign direct investment (FDI) is one of the main drivers of economic growth for developing countries. Numerous studies have proven that FDI has contributed extensively to the transformation of the economy in developing countries (Bende-Nabende et al., 2001; Fan & Dickie, 2000; Har et al., 2008; Muhammad Haseeb et al., 2014; Shaari et al., 2012). The economic and social benefits brought to the host country generated by FDI include the transfer of new technology and management knowledge, efficient productivity, employment creation as well as investment opportunities. On top of that, FDI also brought a higher export volume and thereby accelerated the economic growth of the country (Eusuf and Ahmed, 2007).

Although exports bring numerous benefits to the domestic countries, some studies (Eusuf and Ahmed, 2007; Lee and Huang, 2002; Mishra, 2011) rejected the export-led growth hypothesis and claimed that there are growth-

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driven exports. Are there any other determinants more crucial in driving the economic growth?

A substantial amount of studies argued that economic growth is connecting with the liberalisation policy. Guru-Gharana (2012a and 2012b) noted that there is strong evidence of a long-run relationship between export and FDI to growth during the post-liberalisation period; however, there was a lack of evidence during the pre-liberalisation in India. The said studies also found strong support for Export-led and FDI-led growth hypotheses in the post-liberalisation period. Likewise, Baharumshah and Almasaied (2009), also argued that FDI interacts with human capital and financial development do yield positive spillover effects and positive growth in Malaysia in both short and long-term. However, the studies above did not reach a consensus on the most crucial determinant or stimulus of economic growth.

As consequences of the mixed results with regard to the determinants of economic growth, the main objective of this study is to investigate the impact of export, FDI and trade openness on economic growth in Malaysia using econometric techniques and recent data. This study will first examine the long-run relationship of export, FDI, and trade liberalisation on economic growth in Malaysia and then identify the most significant variable that plays the most crucial role in stimulating the economic growth of Malaysia in recent years. The outcome of this study can provide us with a more general insight about the role of exports, FDI, and trade openness in driving Malaysian economic growth. Besides, it also helps us to have a better understanding of the key determinants that stimulate the economy of Malaysia. Hence, policy makers can gain a clearer and definite direction in designing effective policy and stimuli for the country.

This paper is organised as follows: Section 2 presents the Past Malaysia's Trade Strategy; Section 3 presents literature review; Section 4 describes the theoretical framework and methodology adopted in this study; Section 5 discusses the empirical results, and Section 6 concludes the paper.

2. Past Malaysia's Trade Strategies

During the 1970s, Malaysia was shifting from Import Substitution Industrialisation (ISI) to Export-Oriented Industrialisation (EOI) strategy. By implementing this strategy, improvement in both exports and industry development could be seen during 1968-1980 (Asid, 2010). During that period, there was an establishment of Investment Incentive Act 1968 to attract FDI into export-oriented activities. Therefore, incentives such as tax reduction for export, tariff exemptions, investment credit, and other infrastructure facilities were given to foreign companies. (Kanapathy, 1997). As such, the export in Malaysia was increasing gradually. Moreover, Export Processing Zone (EPZ) was also considered as one of the catalysts to stimulate domestic firms to export as well as to attract foreign investors (Johansson & Nilsson, 1997). Multinational corporations (MNCs) were allowed to enjoy import duty-free raw materials, parts, and components. Cheap labour cost was the main concern of almost every MNC to maintain its competitiveness and efficiency. During that time, MNCs were allowed to set special regulations to limit workers' rights. Thus, the foreign investor was gaining a competitive advantage on its overall production costs. Inflows of FDI enabled the domestic

firms to use foreign knowledge and capital to generate an export base and also an opportunity for them to penetrate global market via foreign affiliates. Moreover, the establishment of EPZ was not only generating a direct catalyst effect on domestic exporters, but it also spilt over to domestic firms outside the EPZs.

The positive effects of EOI are based on few reasons. Firstly, this strategy had fully utilised the economy's labour which reduced the unemployment rate. Secondly, the use of simple technology in the manufacturing industry enabled low skill workers to involve in the production as well as to enhance the overall productivity of the industry. Thirdly, Malaysia was making proper use of natural resources such as forests, air resources, agriculture and minerals during the time. In addition, Malaysia was also supporting the light industry especially electrical and electronics (E&E) industry, the largest source of growth to the country (MIDA, 2014).

However, there was no significant connection between MNC subsidiaries and domestic industries (MITI, 1996). MNCs were merely seeking low-cost locations, instead of market opportunities for exports. Furthermore, the export-led growth was predominantly based upon relatively labour-intensive industries such as the E&E industry, the textiles and apparel industry. These situations had restricted the country's capacity for further technological development of local industries. As a result, the industrial structure became dualistic in nature and created a tight labour market. Due to all these factors, it led to an impetus for the Malaysian government to shift from labour-intensive and investment-driven industrialisation to productivity-driven industrialisation.

As Malaysia has been losing her competitive advantage in labour cost, the second phase of the ISI strategy was taking place to create better linkage with the local economy, in particular through the utilisation of natural resources. In order to minimise the loss from higher labour cost in the domestic market, the government was changing labour-intensive industries to be more capital- and technology-intensive, for instance, heavy industries in machinery, steel, cement, automotive, petrochemicals and other resource-based industries. As a consequence, Heavy Industries Corporation of Malaysia (HICOM) was established to serve the said purpose. By promoting domestic heavy industries, it would be a chance for them to develop and expand the technology and skills to gain technology spillovers in other industries as well (Okposin et al., 2005).

In 1986, the Industrial Master Plan I (1986-1995) was introduced. Under the second phase of the EOI strategy, it aimed to expand specific industries that involved substantial involvement of technology, science and human capital such as electronics and electrical, and textiles. Like ISI strategy, the government provides further incentives in the second phase of EOI strategy to attract FDI by modifying the conditions of foreign ownership through the introduction of the new Investment Promotion Act 1986 which benefits foreign investment in the sectors of manufacturing, agriculture, and tourism. However, the positive effects generated by FDI might not fully absorbed by the local firms because of the incapability to comprehend the foreign operational practices (MITI, 1996). Therefore, there was no noticeable result to the growth of GDP.

Since FDI brought many benefits to the Malaysia's economy, the government was non-stopping its efforts to attract foreign investment further by providing incentives in the control of foreign ownership. In the case of equity participation, foreign equity ownership was allowed to hold up to 100% whenever they were able to fulfil the terms and conditions set by the local government. Finally, there was an upward trend of economic growth in the first half of the 1990s attributed to numerous efforts by the government. However, the government faced a critical challenge which was a high import content in both capital formation and industrial output accompanied by the growth of industries. This was mainly due to the lack of domestic linkages between local firms and the foreign investment which caused an inconsistency of foreign investment's interests with the host government (MITI, 1996).

The government then came up with Industrial Master Plan 2 (IMP2) to solve the problem above which was to diversify the manufacturing sector and improve the linkages between manufacturing sectors and local technological capability as well as manufacturing linkages and competitiveness. Government sensed that the development of indigenous technology and capability was crucial in enhancing the relations between MNC subsidiaries and domestic firms. Besides, the introduction of IMP2 was aiming to involve further in the process of advance technology and knowledge driven in the production in order to develop international marketing (MITI, 1996). IMP2 expected that MNC subsidiaries would continue to be the main source of new technologies. The Malaysian government's strategy included the attraction of FDI continuously by firstly, encouraging MNCs to involve in more sophisticated operations and resulting in the creation of technology transfer. Secondly, deepening the supply chain via the development of capabilities in local firms so that the domestic firms could have a better understanding of foreign technologies. Thirdly, advocating foreign investment to shift into a higher technology plan through the acquisition and development of technological capabilities. Next, developing the information technology (IT) and multimedia industries as IT was a critical determinant in driving economic growth. Lastly, develop world-class Malaysian-owned companies in this context (Best & Rasiah, 2003; MITI, 1996).

The essence of the new growth strategy then shifted from assembly-intensive manufacturing to an integrated, industry-wide approach encompasses both manufacturing and related services (MITI, 1996). With IMP2, industrial development strategy shifted from the traditional industry-based approach to a cluster-based approach which aimed to develop dynamic industrial clusters and strengthen industry linkages, while promoting higher value-added activities.

3. Literature Review

3.1 The Past Studies of Economic Growth in Malaysia

In the context of Malaysia, Choong et al. (2005) aims to incorporate the role of the domestic financial system in transferring the technological diffusion embodied in FDI inflows on the Malaysian economy from 1970–2001. By applying unrestricted error correction model (UECM), the study suggests that FDI tends to enhance economic growth more efficiently when a recipient

country has a well-developed and well-functioning financial sector. Besides that, Har et al. (2008) used annual data of Malaysia to test the nexus between FDI and growth for the period 1970-2005. By applying ordinary least square (OLS) regressions, the analysis shows that there is a positive relationship between the FDI and economic growth, which the relationship is found to be significant.

Another study from Shaari et al. (2012) noted that the rise in foreign direct investment had given a positive impact on Malaysian economic growth. Vector autoregression (VAR) model with cointegration technique, Vector Error Correction Model (VECM) and Granger causality have been employed in this study on annual data from 1971 to 2010. Granger causality test also revealed that GDP has Granger cause to FDI and vice versa. Ismail and Lazim (2014) studied the linkages among the economic growth, FDI, trade openness and capital formation in Malaysia for short- and long-run estimation by using the time series data from the first quarter of 2000 till the fourth quarter of 2011. More specifically, the major objectives of the authors are (i) to identify the pattern of time series data among all variables, (ii) to determine the long-run equilibrium relationship between all variables, and (iii) to examine the causal relationships between all variables. Trade openness is measured by the ratio of the total export and import to GDP. The Johansen cointegration, Granger causality tests, and VECM were employed to evaluate the relationships between all variables. Results from Johansen cointegration test revealed the presence of a long-run equilibrium relationship between economic growth, FDI, trade openness and capital formation. However, in the short-term relationships, the findings revealed bi-directional causality between FDI and capital formation, while there is uni-directional causality between economic growth, FDI, and trade openness, and also between capital formation and economic growth.

3.2 The Determinants of Economic Growth

FDI and exports acted as the vital factors of internationalising economic activity and economic growth in the past few decades (Ehinomen & Daniel, 2012). Numerous studies have been discussed extensively with regard to this issue but there are different perspectives from various scholars (Awokuse, 2005; Dash & Parida, 2013; Dreger & Herzer, 2013; Eusuf & Ahmed, 2007; Hossain & Karunaratne, 2004; Kalirajan *et al.*, 2009; Lee & Huang, 2002; Mishra, 2011).

Dreger and Herzer (2013) employed panel data from 1971-2005 for 45 developing countries to evaluate the nexus between export and growth. By applying panel cointegration methods, this study found no significant association between the growth effect of exports and the capacity of a country to absorb new knowledge. On the other hand, Ehinomen and Daniel (2012) used annual time series data from 1970 to 2010 to test the export and economic growth nexus in Nigeria. Using autoregressive distributed lag (ARDL) method, the results showed that there exist a co-integration (long-run relationship) between export and economic growth in Nigeria.

Besides, Lee and Huang (2002) used quarterly data to analyse the relationship between export growth and output growth in five Asian countries, namely Hong Kong, Korea, Taiwan, the Philippines and Japan. The results

showed that except for Hong Kong, exports lead output prevails in at least one regime for each of the four countries being studied. Likewise, Eusuf and Ahmed (2007) examined whether there was any time series support for such export-led growth hypothesis for seven South Asian Countries using the Engle-Granger's ECM. The findings revealed that real exports and real GDP are cointegrated only in Bangladesh, Pakistan, and Nepal. Meanwhile, Pakistan, Sri Lanka, and Bhutan are cases of export-led growth either short-term or long-term; however, India, Nepal, and Maldives show the opposite result of growth-led exports.

For the case of FDI, Kotrajaras et al. (2011) employed panel cointegration analysis to test the effects of FDI on 15 East Asian countries' GDP. The results signify that the relationship between FDI and economic growth in high-income and middle-income is positive as these countries have better education, infrastructure and also a high degree of trade openness. However, low-income countries are likely to benefit less from FDI as they are having less development and poor infrastructure. Thus, they cannot fully absorb the benefits generated by FDI. Similarly, Asghar et al. (2011) who employed heterogeneous panel for the period 1983-2008 in selected Asian countries also revealed that FDI-led growth hypothesis is valid in four countries namely, Nepal, Singapore, Japan, and Thailand, whereas GDP growth-led FDI hypothesis is accepted in the case of Pakistan, Bangladesh, and Sri Lanka. However, causality in any direction is not observed in the case of India, Maldives, Indonesia, China, Philippines and Korea. On the other hand, findings from Shaari et al. (2012) showed that GDP has Granger cause to FDI and vice versa.

Besides, Tiwari and Mutascu (2011) also employed panel data to examine the effect of FDI inflows on economic growth for the period 1986-2008 in 23 Asian countries. Findings revealed that both FDI and exports helped to accelerate the economic growth. However, only nonlinearity with FDI contributed to boosting the economic growth.

Nevertheless, trade liberalisation is another crucial determinant of the economic growth attributable to the increasing important of international trade. Some studies indicated that there is a strong and positive nexus between the trade openness and economic growth. Aremo (2014) investigated the causal relationship between trade liberalisation, economic growth and poverty level in Nigeria from 1980 to 2009 using time series data. By employing multivariate VAR, the nexus between these three variables suggests that economic growth had a positive impact on trade liberalisation in Nigeria. However, the impact of trade liberalisation on poverty level is proved to be insignificant.

Furthermore, Silva et al. (2013) also used OLS regression to examine the nexus between trade liberalisation and economic growth based on Sri Lanka's national data for the period of 1960 to 2010, a total 51-year period. Two dummy variables were added for trade liberalisation (after 1977) and Free Trade Agreements (FTA). In a nutshell, the results suggest that trade liberalisation may have a positive influence on trade openness and led to the accelerated economic growth of Sri Lanka. Moreover, trade agreements such as the India-Sri Lanka Free Trade Agreement (ISFTA) and the South Asia Free Trade Agreement (SAFTA) had considerable influence on economic growth.

Generally, this study concluded that liberalisation is tending to contribute to the acceleration of economic growth and investment level significantly over the period of 1977 to 2010.

However, Mkubwa et al. (2014) adopted a simple linear regression model to test the impact of trade liberalisation on economic growth in Tanzania using annual time series data for the period of 1970-2010. The results revealed that, although the impact of trade openness on economic growth is positive and significant, it was found to be relatively low ever since the economy is open for international trade.

Based on the past literature, no consensus has been made on the crucial determinants of economic growth.

4. Theoretical Framework

4.1 Export-Led Growth Hypothesis

Export-led growth (ELG) is an economic strategy that most of the emerging countries attempt to apply in order to step into industrialisation industry which can help the country to boost their economy rapidly as well as to enhance the citizens' welfare and standard of living (Wisegeek, n. d.). Countries who applied this economic strategy are often emphasising on the export of manufactured goods such as electrical equipment, machineries, appliances and parts or raw materials. Countries from South East Asian, Latin America and the Middle East have provided good examples of ELG. The relationships between exports and economic growth have been a common topic in the past few decades as it can contribute to policy makers for policy formulations in determining their development plans.

Besides, some empirical analyses showed that exports have an indirect contribution to the economic growth. Firstly, exports enable foreign firms to use foreign exchange to purchase imports of capital goods and intermediate goods that in turn gain the technological and production know-how from foreign firms, thus enhancing cross-border knowledge spillovers (Grossman & Helpman, 1991).

Secondly, Kowalski (2011) suggests that comparative advantage is a critical determinant of trade and it is likely to be a crucial determinant for North-South and South-South trade. Theoretically, comparative advantage is a precondition for absorbing gains from trade through specialisation in the country's most efficient sector (Kowalski, 2011). Investors will utilise their limited funds wisely and invest in concentrated sectors in order to yield the highest profits and reduce the unnecessary expenses. Moreover, some studies also pointed out that not only aggregate factor endowments can be the nation's comparative advantage, but the dispersion of these factors across labour. (Grossman, 2004; Grossman & Maggi, 2000; Ohnsorge & Trefler, 2007).

Thirdly, the combination of international markets and domestic markets is making larger market size than that of domestic market solely. A limited local market size constraints the nation from being further growth and technology advancement. Expanded market enables firms to promote competitiveness and encourage internal trade with lagging regions as firms have to comply with certain common standards in order to survive in the international market (World Bank, 2015).

4.2 Openness-Led Growth Hypothesis

Some authors also pointed out that trade policy plays a pivotal role in economic growth. Rodriguez and Rodrik (2000) argued that trade restrictions bring negative impacts to a country in the long-run. On the other hand, an outward-oriented trade policy provides extensive opportunities and rewards for entrepreneurial activities, which is the extended growth. Moreover, Edwards (1993) claimed that a country with a higher degree of trade to openness could grow faster by absorbing new technologies at a faster pace than a country with a lower degree of openness. In addition, domestic producers can have better access to advanced technologies, learning by making gains and also better management skills, therefore, helped to promote the export volume and eventually boost the GDP growth (Ben-David & Loewy, 1998). Generally, a country with high capital stock helps in accelerating the economic growth. This is because rising in the capital stock represents an improvement in the capacity for production. As a result, domestic firms can produce more goods and services that contribute to a greater economic growth (Adhikary, 2011).

5. Methodology and Data

5.1 Methodology

The objective of this paper is to investigate the impact of exports, FDI and trade openness on the economic growth in Malaysia. Augmented Dickey-Fuller (ADF) test and Phillips-Perron (PP) test were employed to test for the stationary. Meanwhile, Johansen and Juselius (1990) cointegration test was applied to examine the cointegrating relationship among the variables, and VECM was used to test the Granger causality among the variables.

Once the unit roots were confirmed to be integrated of order one, or I (1), Johansen and Juselius's cointegration test was applied to test the relationship between the variables. The Johansen method applied the maximum likelihood procedure to determine the existence of cointegrating vectors in non-stationary time series. The testing hypothesis is the null of non-cointegration against the alternative of the presence of cointegration using the Johansen maximum likelihood procedure. In order to examine the cointegration relationships among two or more variables, the test statistic that consisted of unique distribution (a function of a single parameter) was used in the procedure as expressed in (1).

$$X_t = \alpha + \Pi_1 X_{t-1} + \Pi_2 X_{t-2} + \ldots + \Pi_k X_{t-k} + \nu_t \quad (1)$$

where,

t	=	1, 2, ..., T
X_t	=	p x 1 vector of non-stationary I(1) variables
α	=	p x 1 vector of constant terms
$\Pi_1, \Pi_2 \ldots \Pi_k$	=	p x q coefficient matrices
ν_t	=	p x 1 vector of white Gaussian noises with mean zero and finite variance

If the variables are found to be cointegrated, VECM will be developed to investigate the relationship between dependent and independent variables. The VECM will provide the direction of Granger-causality within the sample period. It allows long-run components of variables to follow equilibrium constraints meanwhile short-run components to have a flexible dynamic specification. Thus, this model is used to the changes in one variable (Y_t) to the changes in other variables (X_t) and the past period's disequilibrium, ε_t. If X_t and Y_t have a similar stochastic trend, current variables in Y_t (endogenous variables) is in part, the result of Y_t moving in line with trend value of X_t (exogenous variable). Through error correction term (ECT), VECM allows the discovery of Granger V/Causality relation (Granger, 1986).

The vector time series can be expressed as $Y_t = (Y1, Y2 \ldots Y_n)'$, while the common VECM formula is as expressed by (2).

$$\Delta Y_t = \delta_0 + \Pi Y_{t-1} + \Sigma\theta_i \Delta Y_{t-i} + \omega_t \quad (2)$$

where,

Y_t	=	(n x n) vector of variables
δ_0	=	(n x 1) vector of constants
Π and θ	=	(n x n) matrices reflecting the short-run and long-run effects
ω	=	(n x 1) vector of white noise disturbances

Meanwhile, the dependent variable of the empirical model is economic growth which proxied by GDP, while the independent variables consist of export, FDI, and trade openness. GDP, export and FDI are measured in real term. For the trade openness, it can be defined as the ratio of the total export and import to GDP (Carbaugh, 2009). The empirical model is expressed by (3).

$$LGDP_t = \alpha + \beta_1 LEXPORT_t + \beta_2 LFDI_t + \beta_3 LOPENNESS_t + \varepsilon_t \quad (3)$$

where,

$LGDP_t$	=	GDP of Malaysia
$LEXPORT_t$	=	total exports of goods and services
$LFDI_t$	=	FDI of Malaysia
$LOPENNESS_t$	=	trade (% of GDP)
t	=	time
ε_t	=	residual

5.1 Data

All data used in this research were extracted from World Bank Indicator from 1970 to 2013 annually. The data covered a period from 1970 to 2013 which comprised 44 observations.

6. Empirical Results and Discussion

6.1 Unit Root Test Result

In this study, the ADF unit root test has been utilised to examine the existence of unit root in the data used in the model. Results from Table 1 have clearly shown that all the variables examined are non-stationary at level. However, they can be rejected after first differencing. Hence, all the variables are I (1).

Table 1: Augmented Dickey-Fuller unit root test results.

	Level		First Difference	
	Intercept	Trend & Intercept	Intercept	Trend & Intercept
LGDP	-1.7553	-2.7308	-5.2061***	-5.2871***
LEXPORT	-2.2733	-1.3405	-5.3904***	-5.9876***
LFDI	-2.326536	-3.387324	-8.700615***	-8.635929***
LOPENNESS	-1.8483	-0.0786	-5.0300***	-5.4376***

Note: Asterisk (***) denotes significant at the 1% significance level.

To enhance the robustness of the results, PP unit root test has also been employed. As shown in Table 2, the results are quite similar with that of ADF test. As such, it can be concluded that all the variables are stationary after first differencing and they are said to be integrated into that same order; that is I (1).

Table 2: Phillip-Perron unit root test results.

	Level		First Difference	
	Intercept	Trend & Intercept	Intercept	Trend & Intercept
LGDP	-1.7441	-2.7706	-5.1247***	-5.2056***
LEXPORT	-2.7722*	-1.2012	-5.4099***	-6.0228***
LFDI	-2.210437	-3.420833	-8.772727***	-8.715117***
LOPENNESS	-1.5636	-0.1211	-4.9568***	-5.3845***

Note: Asterisk (***) denotes significant at the 1% significance level.

In light of all the variables are cointegrated in I (1), Johansen and Juselius (1990) cointegration test is the most appropriate way to examine if there is a long run relationship among all the variables. According to Saji (2008), the advantage of Johansen and Juselius (1990) cointegration test is that it can deal with more than one linear combination that may occur in the context of multivariate. In addition, the Maximum Likelihood (ML) procedure can test for the number of cointegrating vectors which also allows the inferences on the parameter restrictions. Two statistics were utilised to examine the cointegration rank. They are Trace test (λ-trace) and Maximum Eigenvalue test (λ-max). The empirical results are presented in Table 3.

Table 3: Johansen and Juselius cointegration test results.

Trace test: *LGDP*, *LEXPORT*, *LFDI*, *LOPENNESS* (k = 4, r = 1)			
H_0	H_1	λ-trace	99% CV
$r = 0$	$r \geq 1$	63.2784***	54.6815
$r \leq 1$	$r \geq 2$	29.1673	35.4582
$r \leq 2$	$r \geq 3$	4.48203	19.9371
$r \leq 3$	$r \geq 4$	0.22178	6.6349
Maximum Eigenvalue Test: *LGDP*, *LEXPORT*, *LFDI*, *LOPENNESS* (k = 4, r = 1)			
H_0	H_1	λ-trace	99% CV
$r = 0$	$r \geq 1$	34.1112***	32.7153
$r \leq 1$	$r \geq 2$	24.6852	25.8612
$r \leq 2$	$r \geq 3$	4.2603	18.5200
$r \leq 3$	$r \geq 4$	0.2218	6.6349

Notes: r is the number of cointegration vectors, and k represents the lag length. An asterisk (*) significant at the 10% significance level. An asterisk (**) denotes significance at the 5% significance level.

From Table 3, the trace test suggests rejecting the null hypothesis of zero cointegration vector (r = 0) at 5% level of significance for all the variables. The maximum eigenvalue test also further confirms this result as Johansen and Juselius (1990) claimed that this test provides more definite result than that of the trace test as cross terms have been compounded in the test. Thus, a long-run equilibrium relationship is said to exist among all the variables in the model. Hence, VECM is employed to identify the elasticities of the independent variables, in which error correction term (ECT) is also included. The results from vector error correction estimates are shown in Table 4.

Table 4: Implied long-run elasticities of normalized cointegration vector.

Parameter Estimated	Constant	LGDP	LEXPORT	LFDI	LOPENNESS	ECT
Elasticities [t-statistics]	-3.492	1.000	0.776 [12.385]***	0.128 [3.932]***	-0.816 [- 4.705]***	-0.369 [-1.985]**

Notes: Asterisks (*) and (***) denote significant at 10% and 1% levels, respectively.

As the equation shown above, all variables are statistically significant at 1 % level. As such, this result confirms that all the independent variables play important roles in economic growth in Malaysia. Based on the estimated result, when export increases by 1%, real GDP will increase by 0.776 %. Consistent with the theoretical framework of export-led growth, export gives a positive impact on real GDP. The results also consistent with the findings of Kalirajan *et al.* (2009), which suggests that the country is supported by export-led growth hypothesis. An increase of export volume will induce greater growth of the country's economy as export is one of the critical contributors to the country's income.

Besides, the FDI and real GDP are also positively correlated. Based on the empirical result, 1% increase in FDI will lead to 0.128% increase in real GDP. Therefore, it signifies that an increase in the FDI raises Malaysia's real

GDP as FDI involves knowledge spillovers which brought higher national production. The result is in line with the study of Asghar *et al.* (2011) and Kotrajaras *et al.* (2011). Their findings also revealed that FDI-led growth hypothesis is valid in the country.

On the contrary, trade openness possesses a negative impact on the real GDP. When trade openness increases by 1%, the real GDP will drop by 0.816%. This result is contradictory with the theoretical expectation. However, it is consistent with the findings of few studies (Adhikary, 2011; Levine & Renelt, 1992) which implying trade openness showed a shrinking effect on GDP growth rates. In Malaysia, the negative relationship between the trade openness and growth rates might be attributable to the substantial amount of imported goods that are not meant for further productions. In a nutshell, the main determinants of real GDP are export and FDI.

Nevertheless, the ECT value of -0.369 indicated that around 36.9% of the deviations in the GDP would be corrected within a year in order to achieve the long-run equilibrium state. Thus, it can be said that the speed of adjustment to adjust disequilibrium among export, FDI and trade openness in affecting Malaysia's economic growth is relatively slow in the short run.

After determining the ECT value, short-run Granger causality test is carried out by applying the F-test of overall significance in the Wald test context in order to examine the short-run causal relationship among the variables. The results presented in Table 5 show that the null hypothesis cannot be rejected in all cases which depict that the variables have no short-run Granger causality running from the explanatory variables to the dependent variable. In other words, the empirical results imply that export, FDI and trade openness have no ability to Granger cause the GDP growth in Malaysia in the short-run.

Table 5: Short-run Granger causality test results.

	F-statistics (p-value)
Wald Test	LGDP
LGDP	1.1918 (0.3323)
LEXPORT	1.5932 (0.2150)
LFDI	1.0678 (0.3798)
LOPENNESS	2.1400 (0.1194)

To enhance the reliability of the model, diagnostic tests were carried out (see Table 6) to examine the relevance of the results derived from the VECM framework. The diagnostic tests employed in this study included Jarque-Bera (JB) normality test; serial correlation LM test; heteroskedasticity test and recursive estimates.

Table 6: Diagnostic tests.

Diagnostic Tests	F-statistics (p-value)
AR[2]	0.3022 (0.7420)
ARCH[1]	0.0851 (0.7722)
CUSUM	STABLE

Notes: AR[2] and ARCH[1] are the Lagrange Multiplier tests of second order serial correlation and the first order of ARCH effects, respectively. CUSUM refers to the CUSUM stability test.

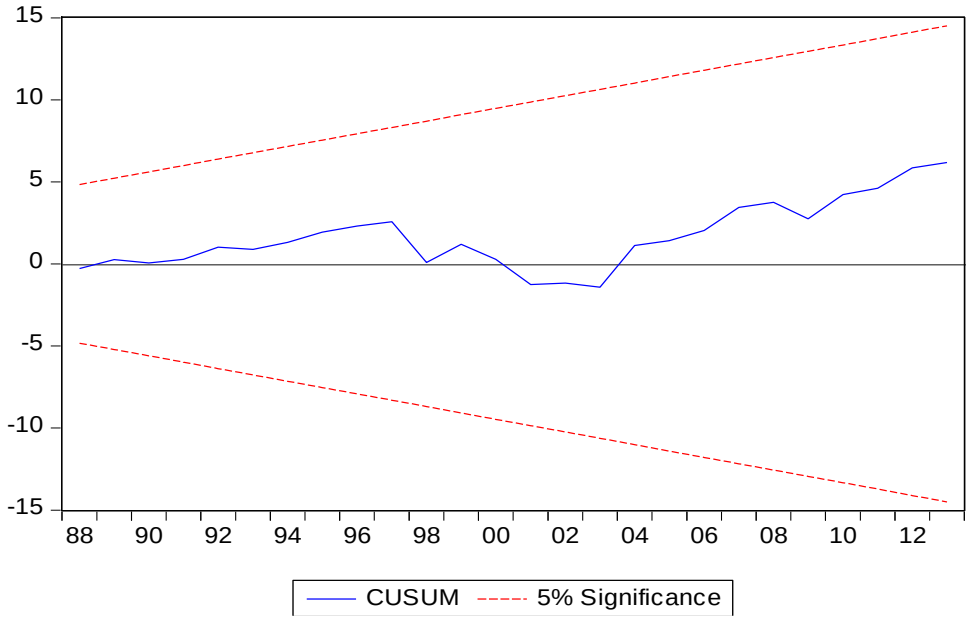

Figure 1: CUSUM stability test for GDP ECM.

From Table 6, the estimated results indicate that the model is serially uncorrelated. In addition, there is no heteroscedasticity problem in the model and is fitted well. The recursive estimate of CUSUM test indicates that this model is stable across the sample period as shown in Figure 1. In short, the estimation derived from this model is reliable.

7. Conclusion

This study has investigated the impact of export, FDI, and trade openness on economic growth in Malaysia using econometric techniques. The Johansen and Juselius (1990) cointegration test result revealed the existence of a long-run equilibrium relationship between economic growth, export, FDI, and trade openness. Based on the normalised equation, it further indicates that the real GDP is more responsive with the export compared to FDI while trade openness has a negative relationship with real GDP. As such, export emerged as the most important determinant of Malaysia's economic growth within this model in the long-run. On the other hand, the Granger causality test revealed that the variables have no short-run Granger causality running from the independent variables to the dependent variable.

Although export had brought substantial income and positive spillover effect to Malaysia over the past decades, further measures are needed to enhance the momentum towards the real GDP. Malaysia is no longer competitive in low labour cost due to the economic acceleration from the large emerging markets such as China and India. According to OECD report (2013), 58% of the Malaysian labour force had only a secondary level education while 13.2% had primary level education and 2.6% had no formal education. It implies that low-skilled labour is still occupying a larger portion of total

Malaysian labour force. Therefore, policymakers should emphasise on human capital development so that Malaysia can transform into knowledge economy successfully and to sustain the exports with high value-added products which in turn further accelerate the economic growth.

References

Adhikary, B. K. (2011). FDI, trade openness, capital formation, and economic growth in Bangladesh: A linkage analysis. *International Journal of Business and Management*, *6*(1), 16-28.

Aremo, A. G. (2014). Trade liberalization, economic growth and poverty level in Nigeria: Vector auto-regression (VAR) approach (1980-2009). *Journal of Economics and Behavioral Studies*, *6*(7), 591-606.

Asghar, N., Nasreen, S., & Rehman, H. (2012). Relationship between FDI and economic growth in selected Asian countries: A panel data analysis. *Review of Economics & Finance*, *2*, 84-96.

Asid, R. (2010). The technical efficiency analyses of manufacturing sector in Malaysia: Evidence from the First Industrial Master Plan (1986-1995). *Asian Social Science*, *6*(2), 99-107.

Awokuse, T. O. (2005). Exports, economic growth and causality in Korea. *Applied Economics Letters*, *12*(11), 693–696.

Baharumshah, A. Z., & Almasaied, S. W. (2009). Foreign direct investment and economic growth in Malaysia: Interactions with human capital and financial deepening. *Emerging Markets Finance and Trade*, *45*(1), 90-102.

Ben-David, D., & Loewy, M. B. (1998). Free trade, growth, and convergence. *Journal of Economic Growth*, *3*(2), 143-70.

Bende-Nabende, A., Ford, J., & Slater, J. (2001). FDI, regional economic integration, and endogenous growth: Some evidence from Southeast Asia. *Pacific Economic Review*, *6*(3), 383-399.

Best, M. H., & Rasiah, R. (2003) Malaysian electronics: At the crossroads. *SME Technical Working Paper Series*, *12*, 1-84.

Carbaugh, R.J. (2009) *International Economics* (12th ed.). The United States of America: South-Western Cengage Learning.

Choong. C. K., Yusop, Z., & Soo, S. C. (2005). Foreign direct investment and economic growth in Malaysia: The role of domestic financial sector. *The Singapore Economic Review*, *50*(2), 245-268.

Dash, R. K., & Parida, P. C. (2013). FDI, services trade, and economic growth in India: Empirical evidence on causal links. *Empirical Economics*, *45*(1), 217-238.

Dreger, C., Herzer, D. (2013). A further examination of the export-led growth hypothesis. *Empirical Economics*, *45*(1), 39-60.

Edwards, S. (1993). Openness, trade liberalization, and growth in developing countries. *Journal of Economic Literature*, *31*(3), 1358-1393.

Ehinomen, C. E., & Daniel, O. O. (2012). Export and economic growth nexus in Nigeria. *Management Science and Engineering*, *6*(4), 132-142.

Eusuf, M. A., & Ahmed, M. (2007). Causality between export and growth: Evidence from South Asian countries. *MPRA Paper (21027)*, 1-18.

Fan, X., & Dickie, P. M. (2000). The contribution of foreign direct investment to growth and stability: A post-crisis ASEAN-5 review. *ASEAN Economic Bulletin*, *17*(3), 312-323.

Granger, C. W. J. (1986). Developments in the study of cointegrated economic variables. *Oxford Bulletin of Economics and Statistics*, *48*(3), 213-228.

Grossman, G. M. (2004). The distribution of talent and the pattern and consequences of international trade. *Journal of Political Economy*, *112*(1), 209-239.

Grossman, G. M., & Helpman, E. (1991). Trade, knowledge spillovers, and growth. *NBER Working Papers Series*, 1-15.

Grossman, G. M., & Maggi, G. (2000). Diversity and trade. *American Economic Review*, *90*(5), 1255-1275.

Guru-Gharana, K. K. (2012a). Econometric investigation of relationships among export, FDI and growth in India: An application of Toda-Yamamoto-Dolado-Lutkephol Granger causality test. *The Journal of Developing Area*, *46*(2), 231-247.

Guru-Gharana, K. K. (2012b). Relationships among export, FDI and growth in India: An application of auto regressive distributed lag (ARDL) bounds testing approach. *Journal of International Business Research*, *11*(1), 1-18.

Har, W. M., Teo, K. L., & Yee, K. M. (2008). FDI and economic growth relationship: An empirical study on Malaysia. *International Business Research*, *15*(2), 11-18.

Muhammad Haseeb, Nira Hariyatie Hartani, Nor' Aznin Abu Bakar, Muhammad Azam, & Sallahuddin Hassan. (2014). Exports, foreign direct investment, and economic growth: Empirical evidence from Malaysia (1971-2013). *American Journal of Applied Sciences*, *11*(6), 1010-1015.

Hossain, M. A., & Karunaratne, N. D. (2004). Exports and economic growth in Bangladesh: Has manufacturing exports become a new engine of export-led growth?. *The International Trade Journal*, *18*(4), 303-334.

Ismail, I. I., & Lazim, M. A. (2014). The linkages among economic growth, foreign direct investment, capital formation and trade openness: Investigation based on VECM. *Department of Statistics Research Paper*. 1-16.

Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration - with applications to the demand for money. *Oxford Bulletin of Economics and Statistics*, *52*(2), 169-210.

Johansson, H., & Nilsson, L. (1997). Export processing zones as catalysts. *World Development*, *25*(12), 2115-2128.

Kalirajan, K., Miankhel, A., & Thangavelu, S. (2009). Foreign direct investment, exports, and economic growth in selected emerging countries: Multivariate VAR analysis. *Center for Contemporary Asian Studies*, *23*, 1-21.

Kanapathy, V. (1997). Labor market issues and skills training: Recent developments in Malaysia. Paper presented at the Sixth Human Resource Development Task Force Meeting in Montreal, 30-31 May.

Kotrajaras, P., Tubtimtong, B., & Wiboonchutikula, P. (2011). Does FDI enhance economic growth? New evidence from East Asia. *ASEAN Economic Bulletin*, *28*(2), 183–202.

Kowalski, P. (2011). *Comparative advantage and trade performance: Policy implications* (No. 121). Paris: OECD Publishing.

Lee, C. H., & Huang, B. N. (2002). The relationship between exports and economic growth in East Asian countries: A multivariate threshold autoregressive approach. *Journal of Economic Development*, *27*(2), 45-68.

Levine, R., & Renelt, D. (1992). A sensitivity analysis of cross-country regressions. *The American Economic Review*, *82*(4), 942-963.

MIDA. (2014). Electrical and electronic. Available from: http://www.mida.gov.my/home/electrical-and-electronic/posts/ (Accessed 9 July 2015).

Mishra, P. (2011). The dynamics of relationship between exports and economic growth in India. *International Journal of Economic Sciences and Applied Research*, *4*(2), 53-70.

MITI. (1996). *MITI report 1995*. Ministry of International Trade and Industry, Malaysia.

Mkubwa, H. M., Mtengwa, B. A., & Babiker, S. A. (2014). The impact of trade liberalization on economic growth in Tanzania. *International Journal of Academic Research in Business and Social Sciences*, *4*(5), 514-532.

Ohnsorge, F., & Trefler, D. (2007). Sorting it out: International trade with heterogeneous workers. *Journal of Political Economy*, *115*(5), 868-892.

OECD. (2013). *Structural policy country notes (Malaysia)*. OECD, Paris, France.

Okposin, S. B., Abdul Halim H., Ong, B. H. (2005). *The changing phase of Malaysia economy*. Kuala Lumpur: Pelanduk Publications.

Rodriguez, F., & Rodrik, D. (2000). Trade policy and economic growth: a skeptic's guide to the cross-national evidence. *NBER macroeconomics annual*, *15*, 261-325.

Saji, T. G. (2014). Has the global financial crisis made India's stock market more independent?. *IUP Journal of Applied Finance*, *20*(4), 83-93.

Shaari, M. S. B., Hong, T. H., & Shukeri, S. N. (2012). Foreign direct investment and economic growth: Evidence from Malaysia. *International Business Research*, *5*(10), 100-106.

Silva, N. D., Malaga, J., & Johnson, J. (2013). Trade liberalization, free trade agreements, and economic growth: The case of Sri Lanka. *Journal of International Agricultural Trade and Development*, *8*(2), 241-257.

Tiwari, A. K., & Mutascu, M. (2011). Economic growth and FDI in Asia: A Panel-Data approach. *Economic Analysis & Policy*, *41*(2), 173-187.

Wisegeek. (n.d.). , What is Export-Led Growth? Retrieved from http://www.wisegeek.com/what-is-export-led-growth.htm

World Bank. (2015). *Expanding market opportunity & enabling private initiative for dynamic economies*, 1-13.