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FOREIGN DIRECT INVESTMENT AND TRADE OPENNESS: DO THEY LEAD TO SUSTAINABLE DEVELOPMENT IN MALAYSIA?

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Abstract: In this research paper, the role of foreign direct investment and trade openness as drivers of sustainable development, are tested against three main pillars of sustainable development, namely; economic growth, income distribution and environmental quality. Foreign direct investment was cited as driver of sustainable development in Investment Policy for Sustainable Development by United Nations Conference on Trade and Development (2012), while trade openness was highlighted by World Trade Organization as another driver for sustainable development especially for developing countries. Three econometric models, which represent the three pillars of sustainable development, are formulated to examine the impact of foreign direct investment and trade openness. The study used annual data from 1970 to 2013 and the analysis was conducted by using Autoregressive Distributed Lag estimation technique. The findings, based on calculated long run elasticity, indicated that foreign direct investment inflows have successfully led to higher growth, better income distribution and lower pollution level in Malaysia. However, for trade openness, the result shows that it is only able to lead to higher growth and lower income gap but insignificant effect on environmental quality. The study found mixed evidence for the effects of other macroeconomic variables in the three estimated models. With the rise in competition from around the world, the study suggests that there is an urgent need for the Malaysian policymakers to revise the existing policies to attract more sustainable foreign direct investments besides making trade more open by involving in more free trade agreements in order to achieve the country's sustainable development goals.

Keywords: Sustainable development, foreign direct investment, trade openness, Bound test, growth.

Introduction

As one of the progressive developing countries in the Asia region, Malaysia is considered as the fourth most open economy in the world with its export and imports accounting for most of its gross domestic product. According to Kim and Lin (2009), trade openness (TO) has played a crucial role in shaping the stages of economic development for Malaysia over many years by acting as a driver of growth. Beside TO, foreign direct investment (FDI) is another vital driver of growth, and is considered as the backbone of growth for this country. The active participation of Malaysia in Association of South East Asian Nation (ASEAN), has transformed this country as one of the favorite destinations for FDIs in the region through the introduction of ASEAN Investment Area (AIA), and has facilitated higher level of trade activities due to the implementation of Common Effective Preferential Trade Agreement (CEPT) scheme. Recently, according to World Investment Report by the United Nations Conference on Trade and Development (2012) and World Trade Organization, the roles of FDI and TO have expanded to include not just the effect on growth but also on income distribution and environmental quality. These three elements, namely economic growth, income distribution and environmental quality, form the three main pillars of sustainable development as addressed by the Commission on Sustainable Development of the United Nations. The concept for sustainable development as defined here has been adopted mainly by all organizations within the United Nations system, as well as most other international and national agencies involved in

the cooperation with the third world countries (Martinussen, 2004). According to Martinussen (2004), sustainability in development means that we are able to meet the needs of the current generation without compromising the needs of future generations.

Achieving sustainable development has become the goal for every country in today's world including Malaysia. Malaysia has integrated the concept of sustainable development in various policies. For example, Malaysia introduced National Development Policy (NDP) which focused on eradicating poverty. The programs under this policy are merged into the national planning process when the Sixth Malaysia Plan (1991 to 1995) was revised in 1995 (Saadatian *et al.,* 2009). Besides NDP, Malaysia also introduced National Conservation Policy (NCP) which was said to function as a framework for the development of natural resources. Moreover, according to Hassan (2004), Malaysian National Vision Policy (NVP) which was realized through the Third Outline Perspective Plan (2001 to 2010), has implanted the concept of sustainable development in its second, fourth and last articles as follows ; (i.) Encouraging more equitable society, (ii.) Sustaining economic development, and (iii.) Pursuing environmental protection. Towards this end, despite the many policies that have been introduced by the Malaysian government to reach sustainable development goals, there is still a lack of empirical assessments on detecting the presence of sustainable development through its three main pillars. Such assessments are needed as the steady inflow of FDI in the recent decade and the deepening of trade liberalization in Malaysia could be the potential drivers for this country to achieve sustainable development as set under ASEAN Vision 2025.

With more than 40 years' history of FDI inflows and increasing openness to trade that Malaysia has experienced, this paper aims to determine the impact of FDI and TO along with selected macroeconomic variables on the above-mentioned three pillars of sustainable development. To the best of the writers' knowledge, this study is perhaps the only study available that investigated the evidence of sustainable development for Malaysia by using these three pillars of sustainable development employing a comprehensive econometric method of assessment.

Selected past studies on the three pillars of sustainable development are reviewed with the condition that the model incorporated both FDI inflows and TO, besides other various determinants in a single framework. Even though FDI inflows and TO are being used as one of the determinants of the three pillars of sustainable development, the previous studies do not relate the outcome of this variable as a potential driver for sustainable development. Besides, the studies only focus on one area or topics (economic growth, income distribution or environmental quality) which, accordingly, can't hardly be made related with the presence of sustainable development. However, the previous studies are able to give greater insight to the researcher on the scope of research on each pillar of sustainable development. A number of past studies are briefly discussed below.

Solarin and Shahbaz (2015) have added new variables, natural gas consumption to capital, FDI, and TO in a growth model to study Malaysian growth for the period of 1971 until 2012. The inclusion of natural gas in the model has become essential in today's world as it emits 50% less environmental pollution compared to other fossil fuels. The outcome of the estimation showed that natural gas consumption, FDI, capital, and TO have a direct relationship to Malaysia's economic growth during the period of the study. The positive association between FDI and Malaysia's growth is similar to the finding of an earlier study by Anwar and Sun (2011). Further, Anwar and Sun (2011) have carried out the Granger causality tests and found that the outcome supported the presence of feedback hypothesis between natural gas consumption and economic growth, FDI and economic growth, and lastly between natural gas consumption and FDI. Using the

World Inequality Database and a static and dynamic panel data analysis, Faustino and Vali (2011) have analyzed the relationship between income inequality and economic globalization, measured by trade openness and FDI, in 24 OECD countries for the period spanning from 1995 to 2007. Faustino and Vali (2011) have used both fixed effect estimators and GMM estimators in the analysis, with the latter being able to avoid endogeneity problems that may exist in the model. The result of the statistical analysis which was conducted using fixed effect estimators shows that higher TO lead to lower inequality whereas higher FDI inflows have increased the inequality. Some control variables introduced in the model, such as inflation and unemployment, also show a positive impact on inequality. However, the results are slightly different when GMM estimation was used. In this case, trade was found to decrease income inequality while the effect of FDI was no longer significant. It was shown for both static and dynamic panel data analyzed that economic growth has caused inequality to increase.

Meanwhile, Shahbaz *et al.* (2013) have used the model of environmental quality to test the impact of FDI, TO, and another macroeconomic variable on pollution for Malaysia based on the period of 1971 to 2011. Their model was tested using Bound test. Other earlier studies on Malaysia, such as Ang (2008) and Lean and Smyth (2010), have included energy consumption as one of the important determinants beside TO and FDI. This is in line with some recent studies that found that development of financial market may also influence energy emissions, while at the same time, motivating technological progress in the energy sector that works to cut emissions. The results of long run elasticity in this study indicated that financial development has led to lower air pollution. This means that the positive and significant influence of financial development is able to counter the opposing environmental deprivation in the country as more financings at lower costs are channeled to investments in environmentally friendly projects. Meanwhile, energy consumption, FDI, and economic growth have been found to worsen the air quality. A more recent study by Ridzuan *et al.* (2017) tested the role of FDI towards economic growth, income distribution and environmental quality on Singapore. The study used ARDL estimation and the covered period were tested from 1970 until 2013. The empirical findings showed that higher FDI inflows improved the economics growth and environmental quality, however, it may also lead towards greater income distribution in the country.

Methodology

Model of Economic Growth

The model of economic growth was derived from the endogenous growth model by extending the simple Cobb-Douglas production function and transforming all variables into logarithmic linear form (LN).

$$LNGDP = \beta_0 + \beta_1 LNLAB_t + \beta_2 LNDI_t + \beta_3 LNFDI_t + \beta_4 LNHC_t + \beta 5 LNTO_t + \beta_6 LNFD_t + \varepsilon_t \text{ --- (1)}$$

LAB (total labor force) is added in the model as a control for other determinants of growth, represented by GDP (real gross domestic product per capita, constant at 2005), while, also helping to reduce the problem of omitted variable bias. Domestic investment, DI (proxied by gross fixed capital formation, constant at 2005) is included, following the extended model proposed by Barro (1999). With DI in the model, we are able to test whether DI is better or not in generating growth as compared to foreign investment under the dependency hypothesis introduced by Amin (1974) and Frank (1978). To strengthen the empirical results, HC (human capital, proxied by secondary school enrollment rate), following the work of Blomstrom *et al.,* (1994) was added as it can play a critical role in absorbing foreign knowledge or skills brought about by foreign investors via the FDI inflows. Besides LAB, we also added financial development, FD (proxied by the ratio of M2 over GDP) as another control variable in Equation 1. This is in line with Hermes and Lensik (2003), which said that the positive growth impact of FDI is dependent on the extent of financial sector development in

host countries. Lastly, the main variables of our study, FDI (foreign direct investment inflows, given as a percentage of GDP) and TO (trade openness, proxied by trade share of GDP, as highlighted by Balasubramanyam *et al.,* (1996), are added in order to determine whether they can potentially bring positive impact on Malaysia's economic growth. According to Bhagwati (1994), the impact of FDI on economic growth tends to be greater in developing countries such as Malaysia, where the export promotion trade strategies are preferred over import-substitution strategies. Generally, based on Malaysia's development performance so far, all coefficients (β_1, β_2, β_3, β_4, β_5, β_6) are expected to have a positive relationship with the country's GDP. Most of the variables selected above can be regarded as having elements of absorptive capacities that enable the host country to absorb and implement new incoming technologies from foreign countries. Besides, it can help to improve the investment climates, promote the efficiency of FDIs, and thus generate growth for the host country.

Model of Income Distribution

Following the model proposed by Tsai (1995) and Mah (2003), we derived Equation 2 as below:

$$LNGINI = \beta_0 + \beta_1 LNGDP_t + \beta_2 LNDI_t + \beta_3 LNFDI_t + \beta_4 LNTO_t + \beta_5 LNFD_t + \varepsilon_t \text{ ---(2)}$$

Higher growth in a country will usually lead to higher income inequality within the society unless the government carefully monitors the situation and implements appropriate and effective policies such as a fiscal policy to curb the problem. However, GDP is expected to have a positive influence on income distribution in Malaysia. The inclusion of DI is crucial as it plays the role of a variable with absorptive capacity that can influence the efficiency of FDI in the model. Meanwhile, the impact of FDI on income distribution can be either way, positive or negative. For example, based on Mundell hypothesis, an increase in FDI inflows will reduce income inequality in middle-income countries. This may be due to the fact that higher movement of capital from other countries will lead to higher wages for the local workers. Given that Malaysia can be considered as labor abundant country, TO is expected to have a negative correlation with GINI (GINI Coefficient) as a result of trade liberalization. Another variable included in the model is FD, which is another important factor that affects income inequality. Greenwood and Jovanovich (1990) has postulated that FD will increase income inequality initially but later lead to its decline once the financial sector matures. To conclude, β_1 is expected to have a positive sign while for the others (β_2, β_3, β_4, and β_5), the signs are expected to be mixed, either positive or negative. As was similarly argued in the case of the model for economic growth, the selection of variables in this model is also based on their absorptive capacity properties since such variables can ensure the optimal impact of FDI on income distribution in Malaysia.

Model of Environmental Quality

Equation 3 is a modified version of the model of environmental quality proposed by Lee (2013).

$$LNEVQ = \beta_0 + \beta_1 LNGDP_t + \beta_2 LNFDI_t + \beta_3 LNFD_t + \beta_4 LNEN_t + \beta_5 LNTO_t + \varepsilon_t \text{ ---(3)}$$

In this model, the real GDP per capita is expected to have a positive influence on the level of environmental quality (EVQ) which is captured by carbon emissions ($\beta_1 > 0$) while effect of FDI on EVQ is expected to be mixed (positive or negative). For example, FDI may have a negative effect on air pollution when it (FDI) facilitates the adoption of modern technologies in the production processes that ensures the best possible environmental practices to energy efficiency, better knowledge transfers, labor training, skill acquisition, introduction of alternative management practices, and etc. (Prakash & Potoski, 2007). The effect of TO on EVQ is also mixed, as its increase may deteriorate or improve environmental quality (Antwieler *et al.,* 2001). For example, an increase in trade openness that result from higher import of environmentally friendly and more efficient technologies will reduce carbon

emissions and enhance environmental quality. Another potential determinant added into the model is EN (per capita energy consumption, measured in kg of oil equivalent) (Ang, 2008). Since higher level of energy consumption leads to greater economic activity and stimulate more carbon emissions, its coefficient (β_4) is expected to have a positive sign. Besides FDI and TO, FD is also expected to have a mixed sign. Frankel and Rose (2002) for example, have found that FD could improve EVQ in countries where more financial resources are allocated to firms that utilize environmentally friendly technologies. In summary, β_1 and β_4 are expected to have positive signs while for other variables (β_2, β_3, and β_5), the signs are expected to be mixed, either positive or negative.

In this time series analysis, the variables are tested for stationarity, by using the conventional Augmented Dickey-Fuller (ADF) and the Phillips–Perron (PP) test. The Autoregressive Distributed Lag (ARDL) bounds test is only allowed to proceed if the tested variables are stationary at I (0) or I (1) but not allowed if the variables are stationary at I (2) to avoid spurious results. Next, ARDL co-integration, also known as Bounds test, developed by Pesaran *et al.* (2001) is applied to test for the existence of long run relationships in the model. The Bounds test is mainly based on the joint F-statistic whose asymptotic distribution is non-standard under the null hypothesis of no co-integration. The null hypothesis of no co-integration is rejected when the value of the F-statistic exceeds the upper critical bounds value and not rejected if the F-statistic is less than the lower bounds value. Otherwise, the co-integration test is inconclusive.

The unrestricted error correction model (UECM) form of ARDL model that contains both short run and long run dynamics are listed as follows:

Model of Economic Growth

$$\Delta LNGDP_t = \beta_0 + \lambda_0 LNGDP_{t-1} + \lambda_1 LNLAB_{t-1} + \lambda_2 LNDI_{t-1} + \lambda_3 LNFDI_{t-1} + \lambda_4 LNHC_{t-1} + \lambda_5 LNTO_{t-1} + \lambda_6 LNFD_{t-1} + \sum_{i=1}^{p} \beta_i \Delta LNGDP_{t-i} + \sum_{i=0}^{q} \gamma_i \Delta LNLAB_{t-i} + \sum_{i=0}^{r} \delta_i \Delta LNDI_{t-i} + \sum_{i=0}^{s} \lambda_{t-i} \Delta LNFDI_{t-i} + \sum_{i=0}^{t} \vartheta_{t-i} \Delta LNHC_{t-i} + \sum_{i=0}^{u} \zeta_{t-i} \Delta LNTO_{t-i} + \sum_{i=0}^{v} \psi_{t-i} \Delta LNFD_{t-i} + \upsilon_t \ldots (4)$$

Model of Income Distribution

$$\Delta LNGINI_t = \beta_0 + \lambda_0 LNGINI_{t-1} + \lambda_1 LNGDP_{t-1} + \lambda_2 LNDI_{t-1} + \lambda_3 LNFDI_{t-1} + \lambda_4 LNTO_{t-1} + \lambda_5 LNFD_{t-1} + \sum_{i=1}^{p} \beta_i \Delta LNGINI_{t-i} + \sum_{i=0}^{q} \gamma_i \Delta LNGDP_{t-i} + \sum_{i=0}^{r} \delta_i \Delta LNDI_{t-i} + \sum_{i=0}^{s} \lambda_{t-i} \Delta LNFDI_{t-i} + \sum_{i=0}^{t} \vartheta_{t-i} \Delta LNTO_{t-i} + \sum_{i=0}^{u} \zeta_{t-i} \Delta LNFD_{t-i} + \upsilon_t \ldots (5)$$

Model of Environmental Quality

$$\Delta LNEVQ_t = \beta_0 + \lambda_0 LNEVQ_{t-1} + \lambda LNGDP_{t-1} + \lambda_2 LNFDI_{t-1} + \lambda_3 LNFD_{t-1} + \lambda_4 LNENY_{t-1} + \lambda_5 LNTO_{t-1} + \sum_{i=1}^{p} \beta_i \Delta LNEVQ_{t-i} + \sum_{i=0}^{q} \gamma_i \Delta LNGDP_{t-i} + \sum_{i=0}^{r} \delta_i \Delta FDI_{t-i} + \sum_{i=0}^{s} \lambda_{t-i} \Delta LNFD_{t-i} + \sum_{i=0}^{t} \vartheta_{t-i} \Delta LNENY_{t-i} + \sum_{i=0}^{u} \zeta_{t-i} \Delta LNTO_{t-i} + \upsilon_t \ldots (6)$$

where Δ is the first-difference operator and v_t is the white-noise disturbance term. Residuals for all the UECM models should be serially uncorrelated and the models should be stable. The above final model for economic growth can be viewed as an ARDL or Bound of order (p q r s t u v) while for the model of income distribution and model of environmental quality, it is of order (p q r s t u).

Beside estimating short run and long run elasticity, this research has also performed the Toda and Yamamoto's (1995) Granger non-causality test through vector autoregressive (VAR) model to verify the direction of causality between the variables for the model of economic growth, model of income distribution and model of environmental quality. The information on the direction of causality between the variables in the models will provide additional inputs for policy recommendations. According to the authors, this method is valid regardless of whether the series is I (0), I (1) or I (2), non-co-integrated or co-integrated of any arbitrary order. Before running the test, the optimum lag for each model is determined using VAR lag order selection based on AIC. Ganger causality test is very sensitive to the selection of lag length. If the chosen lag length is less than the true lag length, the omission of relevant lags can cause biased results, while in the case of higher chosen lag length, the presence of irrelevant lags in the equation will cause the estimates to be inefficient.

This study used annual data from 1970 to 2013. The data for DI, EN, FD, FDI, GDP and TO were extracted from World Development Indicator (WDI) (2016). The sources for other data are as follows: data for HC was taken from Barrolee database (Barro & Lee, 2011), data for LAB from both WDI (2016) and International Labor Organization (ILO), data for EVQ is from both WDI (2016) and Emissions Database for Global Atmospheric Research (2015), and finally, data for GINI coefficients from University Texas Income Project and Global Consumption Income Project.

Results and Discussions

Table 1 below shows the results of the unit root tests for all variables in the three models. The results confirm a mix of stationarities at I (0) and I (1) for all variables, and thus fulfill the criteria to proceed with further analysis using ARDL technique.

Table 2 displays the result of ARDL bounds F-test for co-integration. The maximum lag of 4 was set in each model as shown by the Akaike Information criterion (AIC). The critical values for model of income distribution and model of environmental quality are given under the number of variables, k=5, while for the model of economic growth, the critical value is given under k=6. The F-statistic for each model (5.33, 3.90 and 3.87) is higher than the corresponding upper I (1) critical values in the table for k=6 and k=5, and this renders the model significant at 1 and 5 percent levels, respectively, thus, validates the existence of long run relationship.

The results from Table 3 confirm that all models have passed all diagnostic tests, and this implies that the long-term estimates of these models are reliable. The models show no evidence of serial correlation and have no heteroscedasticity effects in the disturbance terms. Besides, the Jarque-Bera normality test suggests that the errors of each model are normally distributed and all the models are well specified. In addition, the results of the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of square of recursive residuals (CUSUMSQ) based on Figure 1 reveal that all models are stable.

Table 1: Results of ADF and PP Unit Root test

Model	Variable		ADF test statistic		PP test statistic	
			Intercept	Trend and intercept	Intercept	Trend and intercept
Model of Economic Growth	Level	LNGDP	-1.52 (0)	-1.99 (0)	-1.48 (1)	-2.08 (2)
		LNLAB	-1.29 (0)	-1.60 (0)	-1.29 (1)	-1.64 (1)
		LNDI	-2.48 (1)	-2.50 (1)	-2.40 (2)	-2.37 (1)
		LNFDI	-2.84 (8)*	-5.54 (0)***	-5.58 (1)***	-5.54 (1)***
		LNHC	-1.21 (0)	-2.56 (0)	-1.29 (7)	-2.48 (5)
		LNTO	-0.89 (0)	-0.869 (0)	-0.89 (2)	-0.86 (0)
		LNFD	-2.54 (0)	-2.90 (0)	-2.74 (5)*	-2.81 (3)
	First difference	LNGDP	-5.61 (0)***	-5.77 (0)***	-5.621 (1)***	-5.77 (0)***
		LNLAB	-6.50 (0)***	-6.48 (0)***	-6.50 (1)***	-6.49 (2)***
		LNDI	-4.71 (0)***	-4.64 (0)***	-4.65 (3)***	-4.58 (3)***
		LNFDI	-2.84 (9)*	-2.64 (9)	-25.10 (24)***	-24.83 (25)***
		LNHC	-5.85 (1)***	-5.80 (1)***	-5.89 (2)***	-6.01 (3)***
		LNTO	-5.70 (0)***	-5.75 (0)***	-5.67 (2)***	-5.72 (3)***
		LNFD	-5.92 (1)***	-6.11 (1)***	-6.44 (4)***	-7.00 (6)***
Model of Income Distribution	Level	LNGINI	-5.99 (0)***	-5.91 (0)***	-6.04 (2)***	-5.98 (2)***
		LNGDP	-1.52 (0)	-1.99 (0)	-1.48 (1)	-2.08 (2)
		LNDI	-2.48 (1)	-2.50 (1)	-2.40 (2)	-2.37 (1)
		LNFDI	-2.84 (8)*	-5.54 (0)***	-5.58 (1)***	-5.54 (1)***
		LNTO	-0.89 (0)	-0.869 (0)	-0.89 (2)	-0.86 (0)
		LNFD	-2.54 (0)	-2.90 (0)	-2.74 (5)*	-2.81 (3)
	First difference	LNGINI	-7.11 (2)***	-7.55 (2)***	-22.97 (41)***	-36.14 (20)***
		LNGDP	-5.61 (0)***	-5.77 (0)***	-5.621 (1)***	-5.775 (0)***
		LNDI	-4.71 (0)***	-4.644 (0)***	-4.65 (3)***	-4.58 (3)***
		LNFDI	-2.84 (9)*	-2.64 (9)	-25.10 (24)***	-24.83 (25)***
		LNTO	-5.70 (0)***	-5.752 (0)***	-5.67 (2)***	-5.72 (3)***
		LNFD	-5.92 (1)***	-6.11 (1)***	-6.44 (4)***	-7.00 (6)***
Model of Environmental Quality	Level	LNEVQ	-0.81 (0)	-2.17 (0)	-0.81 (0)	-2.20 (2)
		LNGDP	-1.52 (0)	-1.99 (0)	-1.48 (1)	-2.08 (2)
		LNFDI	-2.84 (8)*	-5.54 (0)***	-5.58 (1)***	-5.54 (1)***
		LNFD	-2.54 (0)	-2.90 (0)	-2.74 (5)*	-2.81 (3)
		LNEN	-1.032 (0)	-2.122 (0)	-1.545 (11)	-2.191 (1)
		LNTO	-0.89 (0)	-0.869 (0)	-0.89 (2)	-0.86 (0)
	First difference	LNEVQ	-7.53 (0)***	-7.45 (0)***	-7.52 (1)***	-7.44 (1)***
		LNGDP	-5.61 (0)***	-5.77 (0)***	-5.621 (1)***	-5.77 (0)***
		LNFDI	-2.84 (9)*	-2.64 (9)	-25.10 (24)***	-24.83 (25)***
		LNFD	-5.92 (1)***	-6.11 (1)***	-6.44 (4)***	-7.00 (6)***
		LNEN	-6.63 (0)***	-6.71 (0)***	-6.97 (7)***	-9.63 (14)***
		LNTO	-5.70 (0)***	-5.752 (0)***	-5.67 (2)***	-5.72 (3)***

Note: 1. ***, ** and * are 1%, 5% and 10% of significant levels, respectively. 2. The optimal lag length is determined by using the Akaike Information Criteria (AIC) for ADF test and the bandwidth had been selected by using the Newey–West method for PP unit root test.

Table 2: Results of ARDL bounds F-test for cointegration

Model	Max. lag	Lag order	F-Statistic
Model of Economic Growth	2	(2,2,2,0,2,2,1)	5.332***
Model of Income Distribution	4	(4,0,4,1,0,0)	3.906**
Model of Environmental Quality	4	(4,3,3,4,3,4)	3.869**
		k = 6	k = 5

Critical Values for F-statistics#	Lower I (0)	Upper I (1)	Lower I (0)	Upper I (1)
1%	3.15	4.43	3.41	4.68
5%	2.45	3.61	2.62	3.79
10%	2.12	3.23	2.26	3.35

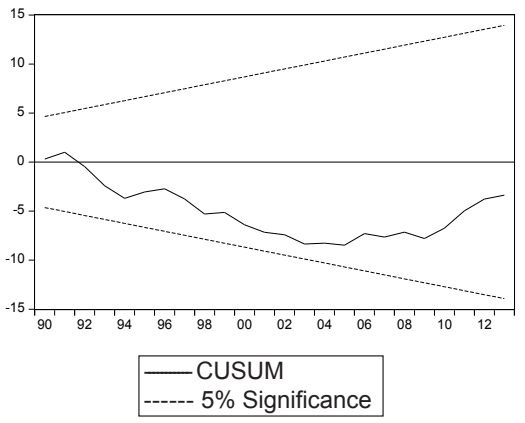
Note: 1. # The critical values are based on Narayan (2004), case III: unrestricted intercept and no trend. 2. k is a number of variables. 3. *, **, and *** represent 10%, 5% and 1% levels of significance, respectively. 4. k =5 for the model of income distribution and model of environmental quality, while k =6 for the model of economic growth. Max refers to maximum.

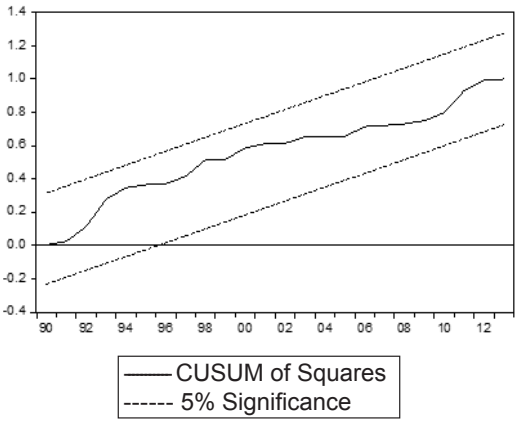
Table 3: Results of Diagnostic Tests

Model	Serial correlation	Functional form	Normality	Heteroscedasticity
Model of Economic Growth	1.33 [0.28]	1.72 [0.20]	1.29 [0.52]	1.53 [0.16]
Model of Income Distribution	2.09 [0.14]	0.07 [0.79]	0.96 [0.61]	1.22 [0.31]
Model of Environmental Quality	1.98 [0.19]	0.01 [0.93]	1.98 [0.19]	0.38 [0.97]

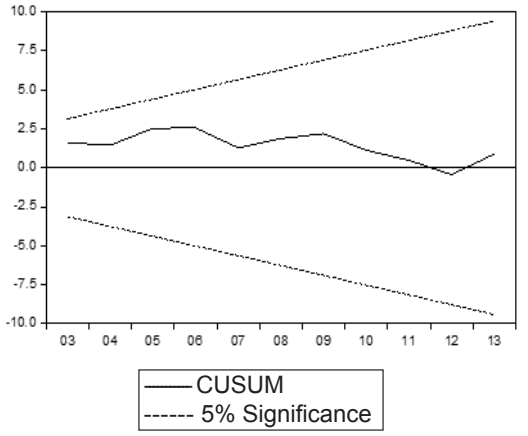
Note: The numbers in brackets [ ] are p-value.

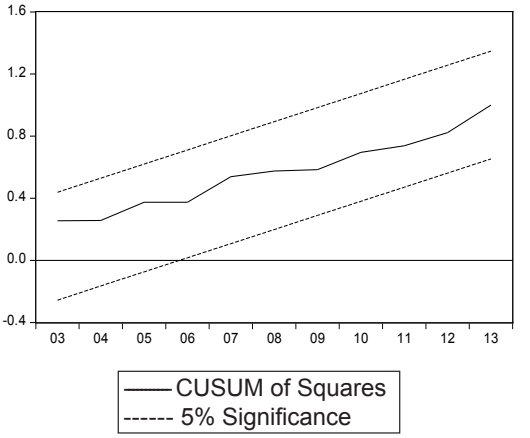
Model of Economic Growth



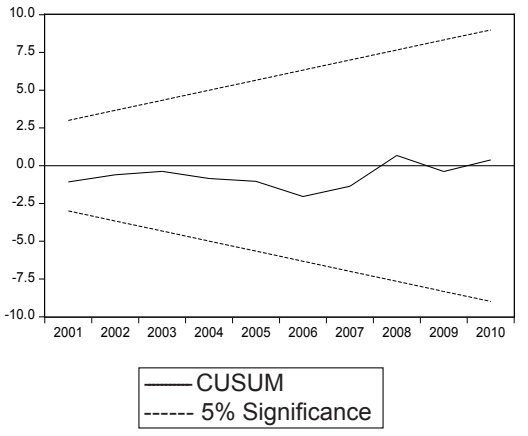


Model of Income Distribution





Model of Environmental Quality



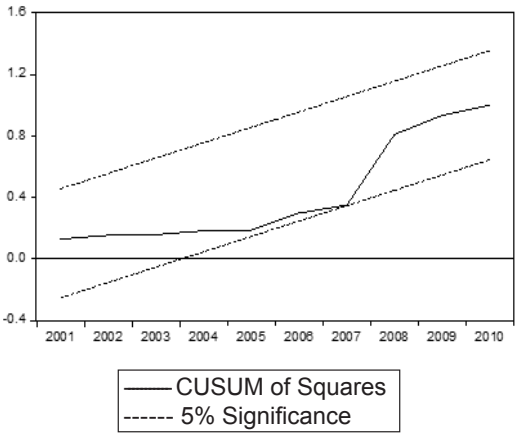


Figure 1: Cumulative Sum of Recursive Residuals (CUSUM) and Cumulative Sum of Square of Recursive Residual (CUSUMSQ)

Table 4 below presents the results of the long run elasticity for each model in this study. Based on the model of growth, DI, FDI, HC, TO and FD have a positive and significant influence (at 1%, 5% and 10 % levels of significance) on the growth of Malaysian economy. Since the coefficient value of DI is greater than that of FDI, it means that domestic investment has contributed more to economic growth than FDI based on the differential productivity argument as proposed by dependency theorists. Rising trade openness (TO) as well as higher inflows of investment was due the active participation of Malaysia as one of the original member of ASEAN group towards the implementation of CEPT scheme to reduce the trade barriers in order to increase the international trade activities and the promotion of AIA that attracted higher FDI inflows into the country. In this case, a 1 percent increase in FDI and TO will increase Malaysia's economic growth by around 0.02 percent and 0.51 percent, respectively. The significance of DI, HC, TO and FD highlights the importance of absorptive capacities of these variables in enhancing the impact of FDI on growth in Malaysia. For example, the important role of human capital development as a crucial facilitator in technology transfers associated with FDI was recorded by Zhang and Markusen (2009).

Next, the results from the model of income distribution show that higher values of DI, FDI and TO will improve income distribution (lower GINI) while higher GDP can worsen it (higher GINI). As for FD, the result shows that it does not have any significant relationship with income distribution in Malaysia. The finding of a negative relationship between FDI and TO to GINI in Malaysia is in line with the studies by Choi (2004) and Reuveny and Li (2003). This can be explained by referring to Mundell hypothesis (Mundell, 1957) in the following way: higher FDI inflows in developing countries like Malaysia will result in a reduction in income inequality due to the higher marginal physical product of labor since there is more capital for each worker to work with. As for TO, the Heckscher-Ohlin and Stolper-Samuelson models explain that, a rise in TO can increase the demand for less skilled workers in the production of labor-intensive products, and this will raise the wages of these workers and decrease income inequality.

In the case of the model of environmental quality, the results show that all variables are found to have a significant influence (at 1% and 5 % levels of significance) on the EVQ in the country except FD. Higher GDP and TO will lead to higher release of carbon emissions in the air (higher air pollution) and thus decrease the environmental quality. An increase in TO for example, will lead to greater economic activities, and as these activities inherently entail environmental costs, they worsen the environmental quality. This result is similar to the recent findings on environmental quality model for Malaysia by Ridzuan *et al.* (2017). The findings on FDI inflows and EN, on the other hand, indicate a negative relationship between these variables and EVQ, thus leading to an improvement in environmental quality. However, it is possible for the combined effects of both FDI and EN on EVQ to outweigh the impact of TO, meaning that there is a chance for Malaysia to enjoy better environmental quality if the government can utilize the FDI mechanism properly and appropriately. Overall, FDI seems to be a better lead driver of sustainable development for Malaysia than TO as it (FDI) is able to successfully promote more growth, better income distribution, and better environmental quality, while TO can bring about favorable impact on growth and income distribution only.

Table 4: Estimation of Long-Run Elasticity

Model of Economic Growth LNGDP		Model of Income Distribution LNGINI		Model of Environmental Quality LNEVQ	
Variables	Coefficient	Variables	Coefficient	Variables	Coefficient
LNLAB	0.0007	LNGDP	0.461**	LNGDP	1.575***
LNDI	0.051*	LNDI	-0.282**	LNFDI	-0.082**
LNFDI	0.016*	LNFDI	-0.037*	LNFD	-0.044
LNHC	0.605***	LNTO	-0.415**	LNEN	-0.637**
LNTO	0.510***	LNFD	0.027	LNTO	0.611***
LNFD	0.047**	C	7.091***	C	-9.604***
C	0.082				

Note: 1. ***, **, * indicate significance at 1%, 5% and 10% levels of significance, respectively.

In this section, we discuss the results of the short-run elasticity estimations as can be viewed in Table 5. Here, we will focus only on the short run impacts of FDI and TO. The result shows a mixture of signs for the variables at different lags for all three models with the variables of the first two models (model of economic growth and model of income distribution) are mostly significant. Based on the model of economic growth, both FDI and TO were found to have a positive relationship with growth. As for the model of income distribution, the result shows that both FDI and TO have significantly improved income inequality. For the model of environmental quality, higher FDI inflows, based on the first lag, appears to improve environmental quality, but later on, seems to lean towards more adverse effect on the environment, towards the last lag. As for TO, based on first lag and last lag, shows that higher openness to trade could also worsen the environmental quality.

Table 5: Estimation of Short Run Restricted Error Correction Model (ECM)

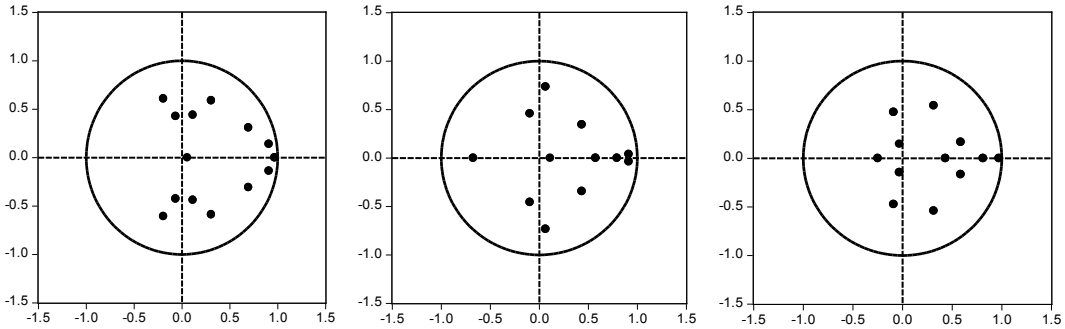
Model of Economic Growth		Model of Income Distribution		Model of Environmental Quality	
Variables	Coefficient	Variables	Coefficient	Variables	Coefficient
$\Delta LNGDP_t$	0.247*	$\Delta LNGINI_{t-1}$	-0.649**	$\Delta LNEVQ_{t-1}$	1.266*
$\Delta LNLAB_t$	-0.013***	$\Delta LNGINI_{t-2}$	-0.781***	$\Delta LNEVQ_{t-2}$	0.823*
$\Delta LNLAB_{t-1}$	-0.007*	$\Delta LNGINI_{t-3}$	-0.599***	$\Delta LNEVQ_{t-3}$	0.571**
$\Delta LNDI_t$	0.110***	$\Delta LNGDP_t$	0.310**	$\Delta LNGDP_t$	0.542
$\Delta LNDI_{t-1}$	-0.097***	$\Delta LNDI_t$	-0.134	$\Delta LNGDP_{t-1}$	-1.063
$\Delta LNFDI_t$	0.008**	$\Delta LNDI_{t-1}$	0.071	$\Delta LNGDP_{t-2}$	-1.266*
$\Delta LNHC_t$	0.330***	$\Delta LNDI_{t-2}$	-0.330***	$\Delta LNFDI_t$	-0.047**
$\Delta LNHC_{t-1}$	-0.136**	$\Delta LNDI_{t-3}$	0.298***	$\Delta LNFDI_{t-1}$	0.017
ΔLNTOt	0.118**	$\Delta LNFDI_t$	-0.039***	$\Delta LNFDI_{t-2}$	0.096**
$\Delta LNTO_{t-1}$	-0.250***	$\Delta LNTO_t$	-0.279**	$\Delta LNFD_t$	0.207
$\Delta LNFD_t$	-0.046**	$\Delta LNFD_t$	0.018	$\Delta LNFD_{t-1}$	0.152
ECT_{t-1}	-0.509***	ECT_{t-1}	-0.672**	$\Delta LNFD_{t-2}$	0.161
				$\Delta LNFD_{t-3}$	0.186
				$\Delta LNEN_t$	0.605
				$\Delta LNEN_{t-1}$	-0.165
				$\Delta LNEN_{t-2}$	0.734*
				$\Delta LNTO_t$	0.989*
				$\Delta LNTO_{t-1}$	0.430
				$\Delta LNTO_{t-2}$	-0.691
				$\Delta LNTO_{t-3}$	0.724*
				ECT_{t-1}	-0.289***
R square	0.99	R square	0.73	R square	0.96
Ad.R square	0.99	Ad.R square	0.58	Ad.R square	0.96

Note: ***, **, * indicate significant at 1%, 5% and 10% significant level. Ad refer to adjusted.

The estimates of long run elasticity in each model were supported by the negative and significant value of error correction term (ECT). ECT represents the speed of adjustment for each model and the negative value means that the variables in each model will converge in the long run. The model of income distribution has the highest speed of adjustment (-0.67), followed by the model of economic growth (-0.51) and the model of environmental quality (-0.29). This means that approximately, 67 percent, 51 percent and 29 percent disequilibria, respectively from the previous year's shock of those models, converge back to the long run equilibrium in the current year. Overall, the R-squared values suggest that almost 99 percent, 73 percent and 96 percent of the variables in the three respective models are able to explain the corresponding dependent variables (GDP, GINI, and EVQ).

As for the Toda-Yamamoto Granger non-causality test, which is to test the causality between variables on each model, the optimum lag detected for a model of economic growth is 4, while for the model of income distribution and the model of environmental quality, it is 5. One extra lag (d_{max}=1) was added to the

optimal lag of VAR model for implementing the Granger non-causality test using Toda and Yamamoto approach. Next, to ensure that each model is dynamically stable, inverse roots of AR polynomial was performed. The result is reported in Figure 2, where all the inverted roots (dots) for each model are shown to lie strictly inside the unit circle, which confirmed that all models are dynamically stable.



Model of Economic Growth | Model of Income Distribution | Model of Environmental Quality

Figure 2: AR Roots Graph

The outcomes of Toda-Yamamoto Granger non-causality test are displayed in Table 6 while the figure illustration can be viewed in Figure 3. Based on the model of economic growth, the result shows unidirectional causalities between the following pairs of variables: (a) LNGDP and LNDI, (b) LNGDP and LNFDI, and (c) LNGDP and LNTO. In addition, it is found that LNFD causes LNDI and LNTO, LNHC causes LNFDI and LNTO, while LNLAB and LNFDI, on the other hand, cause LNDI. The feedback hypothesis is only confirmed between LNDI and LNTO. Although no causality running from LNFDI to LNGDP is detected, there is causality from LNGDP to LNFDI. This suggests that per capita income growth can be taken as a requirement in attracting FDI into the country. In addition, FDI is also important for the country to boost up its DI, since producing better products using more advanced foreign techniques or technologies brought about by FDIs, would encourage more local firms to compete by increasing their domestic investment. The causality running from LNHC to LNFDI means that more FDIs would pour into the economy where there is a higher level of knowledge and awareness as stated by Miyamoto (2003). Realizing this, Malaysian government has allocated a huge amount of the budget into programs such as MyBrain 15 to increase the total enrolment in postgraduate studies in various areas in an effort to boost human capital development in the future.

Table 6: Toda Yamamoto Granger Non-Causality Test

Dependent variable	Direction of causality Model of Economic Growth Short Run							
Malaysia	$LNGDP_t$	$LNLAB_t$	$LNDI_t$	$LNFDI_t$	$LNHC_t$	$LNTO_t$	$LNFD_t$	ALL
$LNGDP_t$	-	2.144	1.653	1.587	1.889	1.005	1.207	10.203
$LNLAB_t$	1.022	-	2.782	1.737	0.742	2.048	0.826	5.495
$LNDI_t$	15.100***	22.761***	-	6.814	16.550***	17.458***	9.707**	54.252***
$LNFDI_t$	10.217**	6.853	10.494**	-	12.851**	6.528	6.101	40.390**
$LNHC_t$	1.995	1.715	1.187	1.921	-	1.955	0.820	9.043
$LNTO_t$	8.620*	7.011	11.336**	12.441**	11.669**	-	8.872*	60.991***
$LNFD_t$	4.449	5.548	4.424	1.941	7.625	3.264	-	104.501***

Model of Income Distribution

Malaysia	$LNGINI_t$	$LNGDP_t$	$LNDI_t$	$LNFDI_t$	$LNTO_t$	$LNFD_t$	ALL
$LNGINI_t$	-	17.459***	6.283	20.916***	14.432**	18.822***	207.096***
$LNGDP_t$	1292.147***	-	809.982***	726.646***	2352.265***	481.094***	4000.027***
$LNDI_t$	7.832	2.535	-	6.487	3.953	2.767	18.229***
$LNFDI_t$	17.654***	10.350*	19.295***	-	13.968**	7.303	140.178
$LNTO_t$	32.283***	50.520***	7.319	8.574	-	11.025**	130.502***
$LNFD_t$	47.451***	33.396***	17.543***	36.167***	31.263***	-	136.077***

Model of Environmental Quality

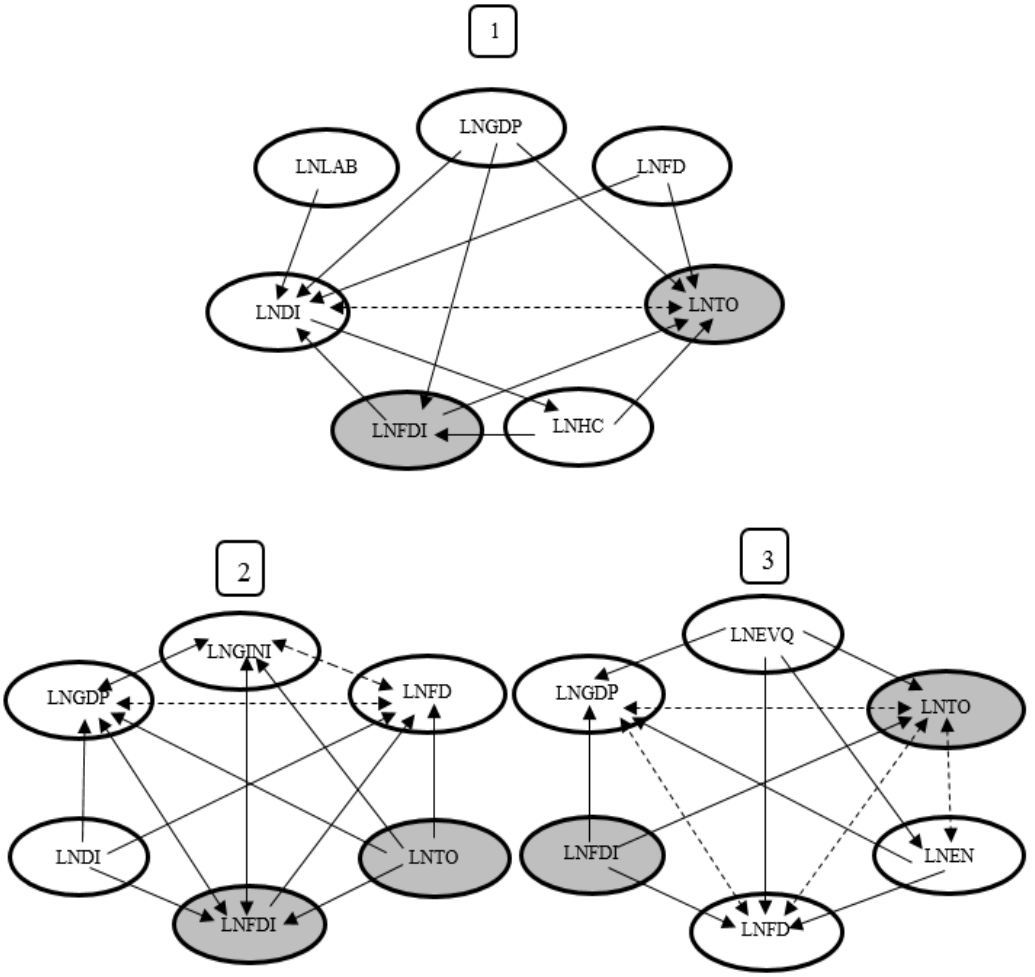
Malaysia	$LNEVQ_t$	$LNGDP_t$	$LNFDI_t$	$LNFD_t$	$LNEN_t$	$LNTO_t$	ALL
$LNEVQ_t$	-	1.238	0.435	2.356	0.680	0.677	9.231
$LNGDP_t$	1110.017***	-	520.819***	536.032***	900.136***	1117.185***	3532.421***
$LNFDI_t$	4.343	4.560	-	2.951	3.290	5.670	13.977
$LNFD_t$	121.809***	86.297***	27.560***	-	56.206***	31.867***	296.170***
$LNEN_t$	19.273***	6.123	3.447	7.885	-	11.227**	86.854***
$LNTO_t$	928.519***	591.780***	342.228***	584.203***	930.637***	-	5000.243***

Note: 1. ***, **, * show significance at 10%, 5% and 1% levels of significance. 2. The optimum lag detected is 4 based on AIC, and $K+d_{max} = 5$ for the model of economic growth. 3. For the model of income distribution and the model of environmental quality, the number of optimum lag detected is 5 based on AIC, and $K+d_{max} = 6$.

For the model of income distribution, there are at least 5 bi-directional causalities detected between the variables, which are between: (a) LNGINI and LNGDP, (b) LNGINI and LNFD, (c) LNGINI and LNFDI, (d) LNGDP and LNFD, and lastly (e) LNGDP and LNFDI. In addition, the following causalities are also identified: LNTO causes all other variables except for LNDI; LNDI causes LNGDP, LNFD and LNFDI; and LNFDI causes LNFD. For the model of environmental quality, a strong bidirectional causality is detected between: (a) LNGDP and LNTO, (b) LNGDP and LNFD, (c) LNGDP and LNTO, and lastly (d) LNTO and LNEN. The finding of bidirectional causality between financial development and economic growth, which confirms the existence of both supply-side and demand-side hypotheses, is consistent with Ndoko (2010), who observed the same for South Africa. Other causalities uncovered include: LNEVQ causes all other variables except LNFDI; LNFDI causes

LNGDP, LNTO and LNFD; and LNEN causes LNGDP and LNFD.

Unlike other studies on Malaysia, such as the study by Tang and Tan (2012), the authors have found a bi-directional causality between LNEN and LNGDP. The inconsistent Granger causalities detected between the variables in these models are not only due to differences in time spans and econometric techniques employed, but also due to the omission of some variables and the use of proxy variable for energy, where the latter are seen to play even more important role.



Note: 1. 1 refers to the model of economic growth, 2 represents the model of income distribution, and 3 is the model of environmental quality. 2. The line refers to unidirectional causality while the dotted line (feedback hypothesis) refers to bi-directional causality.

Figure 3: Toda-Yamamoto Granger Non-Causality Test

Conclusions

Based on the empirical findings of this research paper, the role of FDI inflows as a driver for sustainable development in Malaysia has been confirmed. The FDI inflows have successfully generated higher growth, improved income distribution and enhanced environmental quality in Malaysia based on the period of study. This outcome indirectly indicates the successfulness of Malaysian government agencies, such as Malaysian Investment Development Authorities, in selecting and monitoring all the foreign investment activities by providing various technical assistance and supports to the foreign investors so that the spillovers of the FDI inflows were not only seen in the economic development aspect, but also reaching the social and environment aspects. On the other hand, TO, which is mostly monitored by Ministry of International Trade and Industry is only able to generate favorable growth and improve income distribution but has no significant effect on environmental quality in the country. Thus, in order to achieve the goal of sustainable development for the country, Malaysia, through its government agencies as mentioned above, has to continue to improve its policies to attract more FDIs, while at the same time, monitor closely the trade activities that have led to the degradation of the environmental by adhering closely to the multilaterally agreed set of guidelines among countries participating in the emission targets of Kyoto Protocol. Another alternative is to impose import penalties on some industries that make heavy use of fossil energy sources such as cement, steel, and chemicals. These measures can help to reduce the air pollution that result from trade activities, and thus improve the environmental quality in the country.

Even though FDI has a favorable impact on the three pillars of sustainable development in Malaysia, there is still an issue facing the government, which is, how to ensure a continuous flow of FDI into the country. In this regard, the government needs to continue to come up with more innovative and effective policies from time to time such as revision of Economic Transformation Plan, which was formulated as part of Malaysia's National Transformation Program that can sustain the higher flow of FDI into the country in the face of competition from other emerging countries which are offering the same or better investment packages to attract FDIs to their countries. To conclude, it is observed that Malaysia has undertaken serious efforts to achieve the goal of sustainable development by introducing various relevant policies and developing comprehensive plans, geared towards meeting the three pillars of sustainable development. The outcome from this research paper has given some insights to the policymakers on the role that FDI and TO can play in helping to achieve sustainable development for the country, thus hopefully, motivating them to come up with more innovative and more relevant policies that would direct towards that end. Furthermore, a better understanding about the potential roles of FDI and TO are important for planning suitable policies that may be able to promote both short and long run sustainable development plans in this country.

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References

Amin, S. (1974). *Accumulation on a world scale: A critique of the theory of under development.* Monthly Review Press, New York. 666 pp.

Ang, J. (2008). Economic development, pollutant emissions, and energy consumption in Malaysia. *Journal of Policy Model,* 30(2): 271-278.

Antweiler, W., Copeland, B. R., & Taylor, M. S. (2001). Is free trade good for the environment? *American Economic Review,* 91(4): 877-908.

Anwar, S., & Sun, S. (2011). Financial development, foreign investment and economic growth in Malaysia. *Journal of Asian Economics,* 22(4): 335-342.

Balasubramanyam, V. N., Salisu, M., & Sapsford, D. (1996). Foreign direct investment and growth in EP and IS countries. *The Economic Journal,* 106(434): 92-105.

Barro, R. J. (1999). Notes on growth accounting. *Journal of Economic Growth,* 4(2): 119-137.

Barro, R., & Lee, J. W. (2011). Educational attainment dataset. Retrieved from http://www.barrolee.com, 10 December 2014.

Bhagwati, J. (1994). Free trade: Old and new challenges. *Economic Journal,* 104(423): 231-246.

Blomström, M., Lipsey, R. E., & Zejan, M. (1994). What explains developing country growth? In W. Baumol, R. Nelson, & E. Wolff (Eds.), *Convergence and productivity gross-national studies and historical evidence* (pp. 246-262). Oxford: Oxford University Press.

Choi, C. (2004). Foreign direct investment and income convergence. *Applied Economics,* 36(10): 1045-1049.

Emissions Database for Global Atmospheric Research (2015). CO^2 time series 1990-2014 per region/country dataset. Retrieved from http://edgar.jrc.ec.europa.eu/overview.php?v=CO^2ts1990-2014, 18 November 2015.

Faustino, H., & Vali, C. (2011). The effects of globalization on OECD income inequality: A static and dynamic analysis. DE working papers; No12/2011/DE. Retrieved from https://www.repository.utl.pt/handle/10400.5/3512, 2 April 2016.

Frank, A. G. (1978). *Dependent accumulation and underdevelopment.* Palgrave Macmillan, London. 226 pp.

Frankel, J., & Rose, A. (2002). An estimate of the effect of common currencies on trade and income. *Quarterly Journal of Economics,* 117(2): 437-466.

Global Consumption and Income Project (2015). Income inequality dataset. Retrieved from http://gcip.info/graphs/download, 10 February 2016.

Greenwood. J., & Jovanvoic, B. (1990). Financial development, growth, and the distribution of income. *Journal of Political Economy,* 98(5): 1076-1107.

Hassan, A. A. G. (2004). *Growth, structural change, and regional inequality in Malaysia.* Ashgate Publishing, Burlington, North Carolina. 245 pp.

Hermes, N., & Lensink, R. (2003). Foreign direct investment, financial development, and economic growth. *Journal of Development Studies,* 40(1): 142-163.

International Labor Organization (2015). International labor dataset. Retrieved from http://www.ilo.org/global/statistics-and-databases/lang--en/index.html, 8 December 2015.

Kim, D. H., & Lin, S. C. (2009). Trade and growth at different stages of economic development. *Journal of Development Economics,* 45(8): 1211-1224.

Lean, H. H., & Smyth, R. (2010). CO_2 emissions, electricity consumption and output in ASEAN. *Applied Energy,* 87(6): 1858-1864.

Lee, W. J. (2013). The contribution of foreign direct investment to clean energy use, carbon emissions and economic growth. *Energy Policy,* 55: 483-489.

Mah, J. S. (2003). A note on globalization and income distribution - The case of Korea.

Journal of Asian Economics, 14(1): 161-168.

Martinussen, J. (2004). *Society, state, and market: A guide to competing theories of development,* 4th edition. Zed Books, London. 386 pp.

Miyamoto, K. (2003). *Human capital formation and foreign direct investment in developing countries, OECD Development Centre Working Papers 211.* Paris, France: The Organisation for Economic Co-operation and Development.

Mundell, R. A. (1957). International trade and factor mobility. *American Economic Review,* 47(3): 321-335.

Narayan, P. K. (2004). *Reformulating critical values for the bound F-Statistic Approach to Cointegration: An application to the tourism demand model for Fiji. Department of Economics Discussion Papers.* Victoria, Australia: Monash University.

Ndako, U. (2010). Stock markets, banks, and economic growth: Time series evidence from South Africa. *The African Finance Journal,* 12(2): 72-92.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bound testing approaches to the analysis of level relationship. *Journal of Applied Econometrics,* 16(3): 289-326.

Prakash, A., & Potoski, M. (2007). Investing up: FDI and the cross-country diffusion of ISO 14001 Management Systems. *International Studies Quarterly,* 51(3): 723-744.

Reuveny, R., & Li, Q. (2003). Economic openness, democracy, and income inequality: An empirical analysis. *Comparative Political Studies,* 36(5): 575-601.

Ridzuan, A. R., Ismail, N. A., Hamat, A. F. C., Md Nor, A. H. S., & Ahmed, E. M. (2017). Does equitable income distribution influence environmental quality? Evidence from developing countries of ASEAN-4. *Pertanika Journal of Social Sciences and Humanities,* 25(1): 385-400.

Ridzuan, A. R., Ismail, N. A., and Che Hamat, A. F. (2017). Does foreign direct investment successfully lead to sustainable development in Singapore?, *Economies,* 5(3): 1-20.

Saadatian, O., Salleh, O. M. T. & Dola, K. (2009). Observations of sustainability practices in Malaysian research universities: Highlighting particular strengths. *Pertanika Journal of Social Sciences and Humanities,* 17(2): 225-244.

Shahbaz, M., Solarin, S. A., Mahmood, H., & Arouri, M. (2013). Does financial development reduce CO_2 emissions in Malaysian economy? A time series analysis. *Economic Modelling,* 35: 145-152.

Solarin, S. A., & Shahbaz, M. (2015). Natural gas consumption and economic growth: The role of foreign direct investment, capital formation and trade openness in Malaysia. *Renewable Sustainable Energy Review,* 42: 835-845.

Tang, C. F., & Tan, B. W. (2012). The linkages among energy consumption, economic growth, relative price, foreign direct investment, and financial development in Malaysia. *Quantity Quality,* 48(2): 781-797.

Toda, H., & Yamamoto. T. (1995). Statistical inference in vector autoregressions with possibly integrated processes. *Journal of Econometrics,* 66: 225-250.

Tsai, P. L. (1995). Foreign direct investment and income inequality. *World Development,* 23(3): 469-483.

United Nations Conference on Trade and Development (2012). World Investment Report 2012: *Towards a new generation of investment policies.* Geneva, Switzerland: United Nations Publication.

World Bank (2016). The World Development Indicators 2016 Database. Retrieved from http://data.worldbank.org/data-catalog/world-development-indicators, 5 December 2016.

Zhang, K. H., & Markusen, J. R. (1999). Vertical multinationals and host-country characteristics. *Journal of Development Economics,* 59(2): 233-25.