Determinants of Export: Empirical Study in Malaysia

Lee Sin Yee[1], Har WaiMun[2], Tee Zhengyi[3], Lee Jie Ying,[4] & Khoo Kai Xin[5]

Abstract

This research aims to study the relationship of export with four determinants, namely import, inflation, foreign direct investment (FDI), and exchange rate. Sample years are 1975 to 2013. Ordinary least square (OLS) is used. Results revealed that import has positive relationship with export. This implied that Malaysia import may be an "assembly point exporter". Electric and electrical (E&E), which is Malaysia major export component has high possibly where inputs are imported, then assembly and exported. Foreign exchange rate (domestic currency in term of foreign) has positive relationship with export, thus validating Marshall Learner hypothesis. Inflation has negative relationship as higher aggregate price increase cost of production and decreasing price competitiveness of export. Foreign direct investment has an inverted-U curve relationship, which give further insight into conflicting evidence of linear relationship between export and FDI. Facilities provided to promote export may attract inflow of foreign investment. However, if FDI is targeted to produce for domestic market, it may not contribute to export growth.

Keywords: Export, FDI, import, inflation, exchange rate

1. Introduction

Export can defined as selling the goods or services produced in a country to another country as an international trade. Normally, the sellers of goods and services are called "exporter" and abroad based buyer is called as an "importer". The main concern on exporting was always its benefits to the international trade and the country and also its risk on the possibility that certain domestic industries (or laborers, or culture) could be harmed by foreign competition. Since 1970, Malaysia economy has changed rapidly and not only depends on a few primary commodities. In the same time, Malaysia has developed rapidly from a commodity economy to manufacturing and service sector. Therefore, Malaysia economy has become more outward looking and liberalizes in many sectors.

An economy crisis in 1997 knocks down many countries and this included Malaysia where a drastic drop in demand for goods and service from main countries such as United States (US) and China causes a huge financial crisis.

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[1] Department of Economics, Faculty of Accountancy and Management, University Tunku Abdul Rahman (UTAR), Bandar Sungai Long, 43000 Kajang, Selangor, Malaysia. Email: leesiny@utar.edu.my, Tel: 0163490095
[2] Department of Economics, Faculty of Accountancy and Management, University Tunku Abdul Rahman (UTAR), Bandar Sungai Long, 43000 Kajang, Selangor, Malaysia.
[3] Department of Economics, Faculty of Accountancy and Management, University Tunku Abdul Rahman (UTAR), Bandar Sungai Long, 43000 Kajang, Selangor, Malaysia.
[4] Department of Economics, Faculty of Accountancy and Management, University Tunku Abdul Rahman (UTAR), Bandar Sungai Long, 43000 Kajang, Selangor, Malaysia.
[5] Department of Economics, Faculty of Accountancy and Management, University Tunku Abdul Rahman (UTAR), Bandar Sungai Long, 43000 Kajang, Selangor, Malaysia.

According to World Bank (2015), export growth in Malaysia is decreased sharply in 2009, which is -10.9% since the economy crisis occurred and hurt Malaysia's exports and economic growth in 2009. To save the country, Malaysia government have implemented few policies and many development plans to solve the economy crisis problem. Fortunately, export sector also in Malaysia also became stable after few years of the world recovery. On the other side imports showed that total import growth is declined and became lowest growth, which is -18.8% in 1998 (World Bank, 2015).Besides that, the import growth also decrease sharply became -12.7% in 2009(World Bank, 2015). It is expected export sector should decline with import because the imported intermediate goods are required to use for production of export. From the perspective of macroeconomic view, it is shown that there might have a significant effect from inflation, Foreign Direct Investment (FDI) and foreign exchange rate to export sector.

In 1980, Malaysia is experienced a higher price because of increase prices of oil prices. Inflation in Malaysia increased from 3.7 % in 1979 to 6.7% in 1980 and a highest inflation rate 9.7% in 1981. Other than that, the inflation rate is low at 2.6% in 1990 after a significant growth since growth in the industrial sectors is slower down (World Bank, 2015). Government has reforms policy such as establishment of free trade zones, Investment Incentives Act in 1968 and export incentives alongside the open economy practices have attracted FDI inflow in late 1980 (Ang, 2008).Malaysia FDI net inflows (BoP, current US dollar) is increased sharply from 2009 to 2010 and achieved 15119371105 US$ in 2010 (World Bank, 2015).In the 1997 until 1998, Malaysia currency faced the depreciation because of economy crisis. In this case, Bank Negara Malaysia(BMN) supported the value of the Ringgit Malaysia (RM) by increase the short-term interest rates. However, this effort failed, thus BNM discontinueto defend RM (Ariff and Yap, 2001).

1.1 Objectives of Study

Better understanding of the changes of the export is vital for Malaysia's economy to continue to grow and develop. Main objective is to study about the relationship between import, inflation, FDI, and exchange rate towards export in Malaysia for the period of 1975-2013. Import materials from other countries into Malaysia to assemble locally before the production to export from Malaysia. Therefore, those assembles locally will directly increase export in Malaysia. Is there a relationship between imports towards the export? Inflation will cause the currency of Malaysia became relatively higher. It would cause the price of input and final goods become higher. Therefore, export goods in Malaysia will decrease because of inflation effect in Malaysia. Is there a relationship between inflation towards the export? Previous studies shown that foreign direct investment such as finance, materials and machines in manufacturing sector will directly cause the export rise in Malaysia. Otherwise, foreign direct investment would make the export increasing in Malaysia? Based on the Marshall Lerner theory, export in Malaysia would increase during Malaysia currency (Ringgit Malaysia) is depreciation. Because of Malaysia currency depreciation, it will cause the cost of export become cheaper in Malaysia. Is Marshall Lerner theory can be used in this study? Is there a relationship between foreign exchange rates in Malaysia towards the export? It is acknowledged that assessing relationship between the variables to realize the goal of creating a powerful economy, it is ultimately necessary useful for policymakers making the various structural adjustments.

1.2 Material Studied

According to Joshi and Rakesh (2005), export is the process of selling goods and services to be produced in the home country to other markets in International Trade. Most of the countries perhaps relied exports as the mainstay of their economic growth. Exports are directly influence major source of economic growth that associated as a part of production, while indirectly influence the economic growth by facilitating imported goods and services. In order to strengthen static and dynamic efficiency in the economic growth, by encouraging and focusing on specialization according to comparative advantage would lead to arise in export. Theoretically, a rise in real exchange rate will reduce the domestic currency nominally (Catão, 2007) . In another word, the foreign citizen could buy domestic currency because it is relatively cheaper than the foreign currency. Domestic goods become more competitive as a result of drop in domestic currency, thus the demand of the domestic country's product will relatively increase. According to the study of Van Win coop (2000), a sharp depreciation of currencies of crisis countries would diminish the countries demand for U.S exports if the recession in the crisis country occurs.

In another word, U.S's imports from these countries raise as a result of depreciation foreign currencies. Thus, the Asia crisis was anticipated to contribute negatively to U.S growth through these channels of international trade, in which causes the U.S net export encounter deficit.

Melitz and Ottaviano (2008) found an evidence that when the currency is appreciating, it increases the prices of exports in the foreign markets and decreases the free on board (FOB) export price due to incomplete pass-through. This had cause FOB export revenues to fall, thus less productive exporters lead to negative profit that causes them to exit the foreign market.

Besides that, high-performance exporters would increase more markups but less export volume associated with currency depreciation (Berman, Martin, and Mayer, 2012). The appreciation of Renminbi (RMB) reduces the probability of export participation. (Li, Ma and Xu, 2011). A 1% currency appreciation is associated with 1.89% fall in total exports in China. (Liu, Lu and Zhou, 2014) In Pakistan, real exchange rate is positively associated with exports indicated that appreciation in real exchange rate increase the export price ,in which rise the demand for exports in the market (Kemal & Qadir, 2005).

There are also some study shows that rise in exchange rate in which depreciate the domestic currency is not necessarily rise export in that particular domestic country. According to the study by AiniZakaria , Abdul Rahim & Hazmira Merous (2012) , exchange rate is one of the factors that determine the economic performance of the timber export during managed floating exchange regime. However, exchange rate in not an only element that affect Malaysia timber export because the result of the study was insignificant. In US, exports decision by the firms finds no evidence to identify the relationship between exports and exchange rates (Bernard & Jensen, 2004). In Bangladesh, the impact of exchange rate depreciation might inconsistent for all sub-sectors of export (Alam R., 2010). It might be both negative and positive relationship between export and real exchange rate in different sector of export.

Inflations worst off the economic by reducing the purchasing power of incomes, eroding living standards as well as life's uncertainties (Lipsey et al. 1982: 752).Most of the economist believed that high growth of inflation is likely to associate with declining exports that slowed down the growth at all income levels in a huge group of countries. According to Abidin,Bakar and Sahlan (2013), the determinant of exports can be analyzed by using gravity model. High inflation in one's country will have negative impact on export activities. In Malaysia, its export to Organizational of the Islamic Conference (OIC) member country indicates declining sign when the inflation of Malaysia is increasing because they suggested that Malaysia's export to OIC country can be amplified by promoting pro-liberal and freer trade policies for Malaysian economy. In the study of Gylfason (1998), he studied the relationship between export and determinants which including inflation by statistical methods in cross-sectional data covering 160 countries. He concludes that low exports were induced by high inflation, which indicated a negative relationship among them. Besides, his study also indicates that primary commodities exporter tended to have higher inflation than manufactures exporters. According to the study of Dexter et al. (2005), he found that exports inflation is positively related to each other. However, the analysis shows that export has a negative result on inflation where the coefficient of all explanatory variables are found statistically significant in short run and long run. Moreover, the Granger causality test proposed that a bilateral causality exist between inflation and export.

According to the study of Alavinasab 2014, the result of co-integration shows that the inflation has long run relationship with oil export revenue in Iran, and it support the study hypothesis. The study shows that oil export revenue plays a dual role in the country's inflation process. When oil export revenue boosts, the real variables can be improved and it will be effective in controlling inflation by reducing aggregate demand surplus due to dependence of real variables on oil export revenue. In the study of Jayathileke and Rathnayake (2013), they used co integration and causality test to study the relationship between inflation and economic growth of three Asian countries in short run and long run, which are China, India and Sri Lanka. Evidence found that Sri Lanka had a significant and inverse relationship between inflation and economic growth in long-run. In Kuwait, Saeed (2007) identified a strong negative relationship between gross domestic product (GDP) and inflation in the long term. Cross country evidence indicates that countries with high growth tend to have lower inflation, while the higher inflation has deficit effect in the long run of economic growth (Ahmed and Mortaza,2005). In the view of Bruno and Easrerly (1998), inflation rate which is over 40% might cause inverse relationship between inflation and economic growth.

Bullard and Keatry(1995) agreed that negative relationship exist only if the inflation rates exceeded certain threshold as well. But Levin and Zervos(1998) and Clark(1993) found that uniformly negative relationship that exist between economic growth and inflation depend on the previous consumer price index(CPI) rate.

However, in India and China, there was no evidence to prove significant relationship in between the growth of economy and inflation. There were only a significant and positive relationship was found in the short run. By studying 70 countries, Paul, Kearney and Chowdhury (1997) found no evidence in the exits of relationship between the growth of economy and inflation. Since the high inflation country is highly correlated in cross country evidence, Gregorio (1993) suggested that they have a lower growth in long term.

FDI can act as an indirect channel to affect GDP through positive impact on exports (Guru-Gharana, 2012). According to DeMello (1999) and Chong & Baharumshah (2010), the relationship between exports and FDI is positively affected each other. According to Banga (2007), higher exports in a home country can reduce the uncertainties and risks that attached to FDI outflow. The rise in regional trade and investment agreements has raise the probability of vertically integrated outward FDI in order to make exports and FDI outflow more complementary.

In Vietnam, they found that the significant impact on exports behavior is caused by firm-specific characteristics. It might have significant impacts on export behavior that indicated the existing significant export spillovers to the domestic firm from FDI. Nguyen and Sun (2012) proposed that by promoting export-oriented FDI might enhance the export of local firms which indicated a positive relationship among each other.

In Bulgaria and Romania, Dritsakis (2004) tested that investments granger cause exports. Stylianon (2014) proposed that FDI can affect economic growth in two directions in which investment influence growth by increasing production, employment, value addition, and exports. In order to determine the pattern of FDI and the relationship between FDI, exports, and GDP, in US, he has adopted a time series framework of a vector autoregressive model. It results that growth of GDP and exports did attract FDI according to the approach of time series in long run and short run.

However, Moran (1998) has proposed that a country would be better off by not receiving the foreign investment at all, in another word, he found that FDI and export is negative related with each other. Countries who insist the foreign investors to meet high domestic content requirements had created high competition for the foreigner. As a result, it demonstrates negative impact to the host countries in term of growth and export. A study in Venezuela by Aitken and Harrison (1992) clearly state that FDI and exports are negatively affected each other. In his study, they had identified two effects of FDI on domestic enterprises. Firstly, they found that increase in participation of foreign equity indeed increase the productivity. However, the increase in foreign ownership has a negative impact in domestic firms' productivity in the same industry, thus it declines the output as whole.

Import always increased at a higher pace than the export, thus the current account generally generates deficit in an economy. (Celik, 2011) The study was aimed to close the deficit in Turkey by examining the relationship between export and import in long run by using Engle-Granger (1987) co integration methods. The results show that the foreign trade deficit grows up as a reflection of increasing import and export. In another words, export and import tend to have positive relationship among each other.

According to the study of Mukhtar (2010), its purpose is to test the relationship between exports and imports of Pakistan in long run that being analyzed by Johansen Maximum Likelihood co integration technique. It shows that exports and imports had a significant relationship in long run, in condition that the country is inviolate of its international budget constraints. Moreover, the use of vector error correction model (VECM) confirms its stability of long run equilibrium relationship between exports and imports as well. It suggests that the imports and exports are tended to bring into long run steady state equilibrium by overall macroeconomic policies.

Based on a study that investigates the long run relationship between imports and exports in two pacific island countries, the export and imports was co-integrated in both country (Narayan and Narayan , 2004). While in between the exports and imports in Korea, there was a positive co integration and coefficient on exports (Bahmani-Oskooee and Rhee ,1997) . Furthermore, the recent study that proposed by Arize (2002) found that the co integration between import and export its in US from 1973-1998 had a positive coefficient.

However, the relationship between exports and imports in US has found no evidence in long and imports and the hypothesis cannot be rejected (Fountas and Wu,1999). In another word, there is no evidence from Fountas and Wu that they found relationship exist in between exports and imports.

2. Method

This study used the annual data for Malaysia for the period 1975-2013 for export (Exp), import (Imp), inflation (In), foreign direct investment (FDI) and foreign exchange rate (FEX) from World Bank to determine the relationship among export and independent variables in Malaysia by using the time series analysis. The model could be represented as follow:

$Ex_t = \beta_0 + \beta_1 Im_t + \beta_2 In_t + \beta_3(FDI_t) + \beta_4(FEX_t) + \mu_t$
Where the following notation has been used:
Ex_t = Export
Im_I = Import
In_t = Inflation
FDI_t = Foreign Direct Investment (in log form)
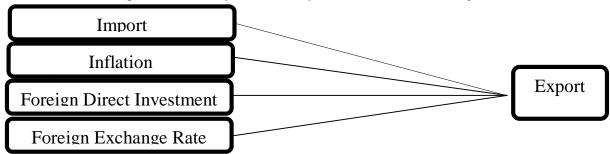FEX_t = Foreign Exchange Rate
μ_t = Error term
In our analysis, the price-weighted real exchange rate is calculated as follows:- $RER = ER*P^f/P^d$

The RER is written from real exchange rate, while the ER represent the nominal exchange rate measure in RM/USD, P^f represent the price in US (foreign price), and P^d denotes the price in RM(domestic price).

2.1 Theoretical framework

Figure 2.1: The export and independent variables in Malaysia

Hypothesis 1

H_0: There is no relationship between import and export
H_1: There is a relationship between import and export

Hypothesis 2

H_0: There is no relationship between inflation and export
H_1: There is a relationship between inflation and export

Hypothesis 3

H_0: There is no relationship between foreign direct investment and export
H_1: There is a relationship between foreign direct investment and export

Hypothesis 4

H_0: There is no relationship between exchange rate and export
H_1: There is a relationship between exchange rate and export

2.3 Analysis Procedure

2.3.1 Unit Root Test For Stationary

Augmented Dickey-Fuller (ADF) test and Philips-Perron (PP) test are conducted to test unit root. The series need to be integrated of order one, $I(1)$, if there is a unit root. Thus, the series tend to behave in a "stationary" manner after integrated of first order.

The residual term was assumed to be unrelated ε_t that is modified from Dickey and Fuller (Dickey & Fuller, 1979) when performing Dickey-Fuller (DF). ADF test is to infer the number of unit roots in which the residual term should being correlated. It is an augmented version of Dickey-Fuller to permit higher-order autoregressive processes and it is more sensitive to the lag collection and smaller sample size. The equation below is for ADF test:

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \alpha_i \sum_{i=1}^{m} \Delta Y_{t-1} + \varepsilon_t \tag{1}$$

Where Δ is the differencing operator, Y_t is our variables of interest β_1 is the constant, and ε is the pure white noise term. The null and alternative hypotheses in unit root are tested below:

H_0: $\delta = 0$ (The series contains unit root)
H_1: $\delta \neq 0$ (The series does not contain unit root)

The decision rule dominated that null hypothesis cannot reject if ADF t-statistic is smaller than the MacKinnon's critical value where the series does have a unit root.

Phillips-Perron (PP) test was carried out to take serial correlation into consideration by making proper corrections to the t-statistic coefficient from the AR (1) regression. The equation below is for PP test:

$$\Delta Y_t = n_0 + n_1 + n_2 X_{t-1} + v_1 \tag{2}$$

Both of the null and alternative hypotheses are:

H_0: $n_2 = 1$ (Y_t is unit root or non-stationary)
H_1: $n_2 < 1$ (Y_t is unit stationary)

The null hypothesis cannot be rejected when the PP modified t-test statistic is larger than the critical value tabulated.

2.3.2 Johansen-Juselius (JJ) Cointegration Test

The Johansen and Juselius (1990) multivariate co integration test will be employed to discover the significance of long-run co-movement relationship among the variables included in equation (1). The residuals from the lagged one period should be accounted for when the VECM model is estimated if the export and its determinant are found to have co integrating equation; unrestricted vector autoregressive (VAR) model is used instead if export and its determinant do not have co integration. The parameter can be expressed in the form of Vector Autoregressive Error Correction Mechanism:

$$\Delta X_t = \sum_{i=1}^{p-1} \Pi_i \Delta X_{t-1} + \alpha \beta' X_{t-p} + \varepsilon_t \tag{3}$$

Two test statistics for co integration which are trace statistic and maximum eigen value statistic are formed as below:

$$\lambda_{trace}(r) = -T \sum_{i=r+1}^{N} \ln(1 - \hat{\lambda}_i) \tag{4}$$

$$\lambda_{max}(r, r+1) = -T \ln(1 - \hat{\lambda}_{r+1}) \tag{5}$$

λ_{max} test uses the alternative hypothesis of $r = r_0 + 1$ while λ_{trace} test uses the alternative hypothesis $r > r_0 + 1$. The λ_{max} attempts to increase the accuracy of the test by limiting the alternative hypothesis to a co integration status with the difference in alternative hypothesis. The hypothesis for both λ_{trace} and λ_{max} are:

At r=1, H_0 : There is co integrating vector
H_1 : There is no co integrating vector
At r=1, H_0 : There is co integrating vector
H_1 : There is no co integrating vector

2.3.3 Jarque-Bera (JB) Test for Normality

The normality test known as the Jarque-Bera used that compared 3rd and 4th moments of the residuals to those from the normal distribution. The hypothesis tested as below:

H_0: The residuals have normal distribution
H_1: The residuals have no normal distribution

If the p-value is not more than the significance level of 5%, the null hypothesis can be rejected. If the p-value is larger than 5%, the null hypothesis cannot be rejected and indicated that the error term have a normal distributions.

2.3.4 White Heteroscedasticity Test for Heteroscedasticity

White Heteroscedasticity Test is used to examine whether the residuals are homoscedastic (no heteroscedasticity problem) and the regressors are correctly specifically .The hypothesis tested:

H_0: Homoscedasticity
H_1: Heteroscedasticity

Null hypothesis is rejected and can be concluded that heteroscedasticity effect exists if probability value of Chi-Square distribution is smaller than the significance level. If the opposite happens, the residuals have constant variance.

2.3.5 Durbin-Watson d-test for Autocorrelation

For serial correlation test, Durbin-Watson d-test it able to detect whether the serial correlations are present in error terms in regression, also identifies the presence of autocorrelation. The hypothesis tested:

H_0 : There is no positive or negative autocorrelation
H_1 : There is autocorrelation

Decision rules for Durbin-Watson d-test showed below:

Table 2.1: Durbin-Watson *d* Test: Decisional Rules

Null hypothesis	Decision	If	Result
No positive autocorrelation	Reject	$0 < d < DL$	Positive serial correlation
No positive autocorrelation	No decision	$DL \leq d \leq DU$	Inconclusive
No negative correlation	Reject	$4\text{-}DL < d < 4$	Negative serial correlation
No negative correlation	No decision	$4\text{-}DU \leq d \leq 4\text{-}DL$	Inconclusive
No autocorrelation, positive or negative	Do not reject	$DU < d < 4\text{-}DU$	No serial correlation

2.3.6 Auxiliary Regressions Test for Multicollinearity

Multicollinearity can be test based on computing the variance-inflating factor (VIF) and tolerance (TOL) by using Auxiliary Regressions Test's R^2.

$$VIF = \frac{1}{(1-r^2)}$$
(6)

$$TOL = \frac{1}{VIF} = (1 - R^2)$$
(7)

If VIF computed is 5 or 10 and above, there will be a multicollinearity problem among the independent variables. However, the value of VIF would likely to be 1 if there is no collinearity between the independent variable.

In equation 7, if the TOL value computed is close to 0, there is most likely to be collinearity among the independent. If the value computed is lesser than 0.1, there will be a serious multicollinearity.

3. Result

3.1 Unit Root Test

The value of ADF t-statistic and PP z-statistic was obtained by using the two options which included with trend and intercept (first option) and without trend and intercept (second option).

The result of Unit Root Tests from E-view software is shown in the Table 3.1.

Table 3.1 Result of Unit Root Tests

	ADF		PP	
Level	With Trend and Intercept	Without Trend and Intercept	With Trend and Intercept	Without Trend and Intercept
Export	.-5.692849***	-2.828491**	.-5.692849***	.-2.671604**
Ifdi	.-2.785229	.0.904853	.-5.001327**	.1.857797
Forex	.-1.709704	.-1.496804	.-1.709704	.-1.387779
Import	.-5.170814***	.-3.339395**	.-5.165844***	.-3.356924**
Inflation	.-4.041874*	.-1.23613	.-3.890167**	.-1.62169*
First Different				
Export	.-6.149847***	.-6.231441***	.-21.28195***	.-19.77942***
Ifdi	.-2.761637	.-2.022972**	.-17.83887***	.-12.79538***
Forex	.-4.794509**	.-4.949989	.-4.893536**	.-4.940935***
Import	.-8.046309***	.-8.281011***	.-24.03388***	.-20.85496***
Inflation	.-8.071448***	.-8.295478***	.-8.126739***	.-8.355252***
Second Different				
Export	.-5.565536***	.-5.829137***	.-29.93202***	.-31.10712***
Ifdi	.-6.158825***	.-6.351626***	.-56.81987***	.-58.6427***
Forex	.-5.753811***	.-5.926361***	.-24.8556***	.-24.58073***
Import	.-5.395208***	.-5.646415***	.-37.06636***	.-33.0799***
Inflation	.-9.499676***	.-9.795717***	.-11.09065***	.-11.43965***

Notes: ***, **, * shows rejection of null hypothesis at 1%, 5%, and 10% level of significant.

Based on table 3.1, at the level, only export and import are significance at 1% significant level for both tests (with trend and intercept). At the first difference, in ADF test (with and without trend and intercept), Ifdi and export are not significance at all. However, result shown that all the variables are significance at 1%, 5% and 10% significant level for both tests at the second difference. This indicates all variables are stationary at second difference and integrated in the I(1) order. The result shows that each exogenous variable is stationary at different significant level, thus co integration test is required.

3.2 Co integration Test

Johansen-Juselius co integration test has been carried out to test whether variables are co integrated. Table 3.2 shows result of co integration test.

Table 3.2 Result of Co integration Test

Hypothesized No. of CE(s)	Eigen value	Trace Statistic	Critical Value (5%)
None *	0.659258	85.24698	69.81889
At most 1	0.463429	45.41173	47.85613
At most 2	0.349663	22.37715	29.79707
At most 3	0.151806	6.457366	15.49471
At most 4	0.009828	0.365451	3.841466

Notes: * indicates rejection of null hypothesis at 5% significant level.

According to the estimate of trace statistic, the trace value is larger than critical value (85.24698 > 69.81889) at r=0, this indicates that the decision rule is to reject null hypothesis. General result of analysis shows that long run relationship exists among variables. Hence, these prove that the possibility of results obtained from unit root tests is correct.

3.3 Empirical Results

Determinants of export in Malaysia consist of four independent variables which are import, inflation, FDI and exchange rate which encompassed $LFDI_t$, $LFDI^2_t$, $IMPORT_t$ and $IMPORT^2_t$. Table 3.3 shows the result of Ordinary Least Square (OLS) test for each independent variable.

Table 3.3 Result of OLS

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-541.1674	256.5631	-2.109295	0.0428
LFDI	114.1134	56.32191	2.026092	0.0512
LFDI^2	-6.023771	3.065501	-1.96502	0.0581
IMPORT	0.388217	0.089835	4.321452	0.0001
IMPORT^2	0.003947	0.004642	0.850229	0.4015
INFLATION	-1.251207	0.437879	-2.857426	0.0074
FOREX	0.085081	0.039746	2.140638	0.0400

R-squared = 0.71004
F-statistic = 13.06001
Probability (F statistic) = 0

The equation of Model 1 has been formed according to the result of OLS. The equation is shown as below.

MODEL 1: EXPORT = -541.1674+ 114.1134 $(LFDI_t)$- 6.023771 $(LFDI^2_t)$(S.E.)(-256.5631)**(-56.32191)*(-3.065501)*+0.388217$(IMPORT_t)$ + 0.003947$(IMPORT^2_t)$ (-0.089835)*** (-0.004642)

Referring to Model 1, the coefficient for both $IMPORT_t$ and $IMPORT^2_t$ are positive. $IMPORT_t$ is significant at 1% significant level while $IMPORT^2_t$ is not significant. Similarly, the coefficient of $LFDI_t$ is positive and significant at 10% significant level. Besides, $LFDI^2_t$ has negative coefficient and it is significant at significant level 10%. Therefore, this caused the LFDI has an inverted U curve. This statistically proved that LFDI not only in linear form and it also can be in a quadratic form. Moreover, the probability of F-statistic is equal to zero indicates that the model is fit.
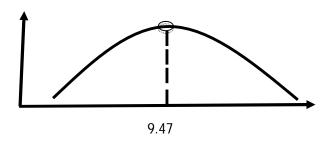
The calculation below shows the turning point when EXPORT partial with LFDI is 9.47% while the graph 1 shows the Inverted U curve between EXPORT and LFDI.

EXPORT = -541.1674 + 114.1134 $(LFDI_t)$ - 6.023771$(LFDI^2_t)$
0 = 114.1134 – 12.047542 $(LFDI_t)$
LFDI = 9.47%
Graph 1: Inverted U curve between EXPORT and LFDI

9.47

Initially, there is an upward sloping curve between export and LFDI. This can be explained by there are many foreign manufacturing investments started to flow into different industries. For example, automobiles industry, petrochemical industry, electrical and electronics industry and so on. The economics in Malaysia able to gain benefits as a result of increasing in FDI growth. This is because there will be in excess of capital and transfer of technology from foreign to local firms. Thus, this helps local firms to strengthen their competitiveness in international markets.

With the learning of new technology in the production, domestic firms can enhance their export competitiveness and this will lead to a rise in export.

Nevertheless, once export reaches the optimal point which is 9.47%, it started to decline. This is because of the counter attack reaction to FDI influences. After some level of FDI growth, host countries will tend to impose various restrictions such as tariffs, high domestic content, joint venture with local firms, technology sharing and licensing requirements. The purpose of doing these is to protect and prevent the domestic firms from being harm by new foreign entries which they will compete for resources and labor with domestic firms. The imposition of restrictions able to slow down or even cause negative impact of FDI to economy, including output growth and export growth.

3.4 Normality Test

Table 3.4 shows the result of normality test.

Mean	-7.19E-14
Median	0.045918
Maximum	8.8879
Minimum	-9.150714
Std. Dev.	4.096966
Skewness	-0.024687
Kurtosis	2.798125
Jarque-Bera	0.070186
Probability	0.965515

The probability obtained from the Jacque-Bera test is 0.965515 which is larger than 0.05 indicates hypothesis is not significant and residual has normal distribution. Other than that, mean value of residual which is -7.19E-14 is nearly to zero. The shape of the histogram shows that the residual is normally distributed, in other words, it does not skew to either left or right.

3.5 White Heteroscedasticity Test and ARCH Test

Table 3.5 and table 3.6 show the results of white heteroscedasticity test and ARCH test.

Table 3.5 Result of White Heteroscedasticity Test
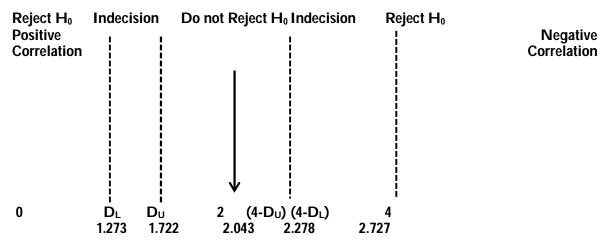
HeteroskedasticityTest:WHITE

F-statistic	1.148664	Prob. F(24,14)	0.4038
Obs*R-squared	25.86488	Prob. Chi-Square(20)	0.3601
Scaled explained SS	15.65564	Prob. Chi-Square(20)	0.9001

Table 3.6 Result of ARCH test

Heteroskedasticity Test: ARCH			
F-statistic	0.032523	Prob. F(1,36)	0.8579
Obs*R-squared	0.034299	Prob. Chi-Square(1)	0.8531

The probability of Chi-square obtained from both heteroscedasticity and ARCH tests are 0.3601 and 0.8531 and greater than 0.05 and not significant. This clearly shows residuals do not have heteroscedasticity problem at 5% significant level.

3.6 Durbin-Watson d test for Autocorrelation

Reject H_0	Indecision	Do not Reject H_0 Indecision		Reject H_0
Positive Correlation				**Negative Correlation**

0	D_L	D_U	2	$(4-D_U)$	$(4-D_L)$	4
	1.273	**1.722**	**2.043**	**2.278**		**2.727**

The Durbin-Watson statistic obtained from the test is 2.043. The value of dL and dU are 1.273 and 1.722 with 39 observations. The d statistic is greater than D_U but smaller than $(4-D_u)$ which means it falls in do not reject H_0 region. This means no problem of autocorrelation exists in model.

3.7 Multicollinearity

Table 3.7 Results of Multicollinearity Test

Dependent variables	R^2	TOL	VIF
lfdi	0.457499	0.542501	1.843315
forex	0.496628	0.503372	1.986602
inflation	0.211591	0.788409	1.268377
import	0.101889	0.898111	1.113448

Referring to the values of TOL, there will be no multi co linearity problem in the model as each TOL value for the variables is not closer to zero; each of the value is more than 0.05. Based on the values of VIF, the result clearly showed that each VIF value for the variables is not greater than 10, the values obtained from the test are in the range of 1 to 2 which is far away from 10. It is concluded no multi co linearity problem exist in model and hence, do not reject null hypothesis.

4. Discussion

The variables are proven by test of unit root (PP and ADF tests) which they significance at 1%, 5% and 10% significant level for both tests at the first difference. In other words, they are in stationary at first difference. Other than that, the Johansen-Juselius Co integration test that has been carried out shows that long run relationship is exists between variables. This is because trace value is higher than critical value at r=0. Moreover, next test has been carried out was the normality test to test the normality of residual. The result of this test proves that the residual is normally distributed with the shape of histogram which does not skew to either left or right. This can be explained by p-value is higher than alpha value (5%) and zero mean value are closely to zero.

Furthermore, the white heteroscedasticity test and ARCH test have been run to test heteroscedasticity problem in the model. The results obtained from both tests show that the chi-square values are greater than alpha value (5%). Thus, this denotes that there is no white heteroscedasticity problem. Besides, the Durbin-Watson test has also been carried out in this study showed autocorrelation problem does not exist in this model. Lastly, the last test is multi co linearity test which is used to determine linear relationship among variables. The result shows that there is no exist of multi co linearity problem with supports of TOL values are not closer to zero and VIF values are less than 10.

Based on this research, we found out that there are some useful and effective policies and activities which can be used to increase the export.

The first implication of the study is there are some of imported goods would be re-exported after value added in Malaysia. In other words, an exported good might require some of the significant intermediate inputs that import from domestic manufacturers. Hence, the purchases of intermediate imports which use in the production of certain products will export to other countries after the value added. This especially reflects the electrical and electronics (E&E) sectors in certain selected products which included consumer electronics, electronic components and industrial electronics. For example, computers, semiconductor devices so on and so forth. China, USA, Singapore, Hong Kong, and Japan are the major export destinations for Malaysia. All these would help to reduce the imposition of import quota and tariffs and encourage more trade at the same time. With more trading activities in the market will lead to an opportunity in opening markets that are more new. Thus, obviously there will be a significant increase in trade.

The second policy is to avoid inflationary policy. Once the inflation takes place in the economic market, this indicates that the price of goods and production inputs will increase. Increasing in the price of goods and production inputs will lead to a rise in the cost of production. Therefore, this will cause a decline in export competitiveness and decrease in export volume, unless the products are well known brands or monopoly products. Besides, it is needed to avoid unnecessary fiscal policy. Balancing the budget is important in order to prevent or reduce the budget deficit and debts. It is suggests that the government should make their spending in the projects wisely that regarding to the production capabilities which able to provide benefits to the people such as the project of Mass Rapid Transit (MRT) construction. If the unnecessary fiscal policy can be successfully avoided, there will be a rise in the aggregate demand and thus increase in both the price of goods and production inputs.

Moreover, FDI screening is another effective policy that can be used to increase the export. FDI screening is important to ensure that the investments are flow into the finance and manufacturing sectors which are able to stimulate the export and increase the export competitiveness. Conversely, if the FDI are flow into the educational sector, it is hardly and difficult to enhance the export competitiveness. This is due to the reason that this sector is totally unrelated with the export. As more and more investments flow into this sector, there will be no any changes in export and it might reduce the export competitiveness. Thus, in order to prevent these from occurring, it is requires and necessary to make sure the quality of FDI to invest in service sector.

Lastly, the last policy is to practice the weak currency policy which consistent with the Marshall-Lerner hypothesis. For instance, if the domestic currency depreciates, this means that domestic currency devalues. This causes prices of foreign goods to be higher as compared to the prices of domestic goods. Thus, this will stimulate export and lead to a positive quantity effect on trade balance. This is because with lower price of domestic goods, foreign consumers will prefer to buy more on our exported goods. Conversely, domestic consumers will not choose to purchase the imported goods relative to domestic products. Other than that, this weak currency policy is previously practiced by Japan and currently practice by China.

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