

Investigating Exports Performance between Malaysia and OIC Member Countries from 1997-2012

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Abstract

The purpose of this study is to examine the impact of macroeconomic factors such as GDP, CPI, TRGDP and ER on exports between Malaysia and other OIC countries using a panel data for the period of 1997-2012. The panel unit root tests have been applied to confirm the stationarity and level of integration. The overall unit root tests (Dickey & Fuller, 1979; Im, Pesaran, & Shin, 2003; Levin, Lin, & James Chu, 2002) result shows that all the variables are stationary at level and become non-stationary after taking first difference. The Kao cointegration test results approved the cointegration among the panel of proposed countries. After confirm the stationarity level and cointegration FMOLS test is employed to analyze whether a long run relationship between variables exist. The results obtained show that only GDP, TRGDP and ER have significant effect on exports. In examining the short-run relationships among variables, a panel ECM is the applied and it is observed that only ER and TRGDP have positive effect on exports. Results from this study can be used as guidance for policy makers on exports where government can give more attention on both ER and TRGDP to influence exports in the short run.

Keywords: exports, FMOLS, OIC, Malaysia

1. Introduction

There are several researcher developed the definition of international trade but the most common is “*The buying and selling of goods and services across national borders is known as international trade*”. International trades have huge contribution in the world economy. International trade plays an important role in the development process in Malaysia particularly in transforming the economy from a low income to upper-middle income category. Since three decades the United States of America, The European Union (EU) and Japan were Malaysia’s major trading partners. Nevertheless, Malaysian importing and exporting trends have been changed after the world economic and financial crises in 2008 and 2009. The Malaysian main trends of imports and exports are changes towards new and non-traditional markets such as (MITI, 2010). Under the New Economic Model (NEM), the Malaysian government has embarked on a new strategy to shift its trade dependency on the traditional markets and exploring new markets for exports and imports. One of the markets being targeted is the Middle Eastern countries. In addition, exports relationship between Malaysia and other OIC countries becoming more relevant especially after the world economic and financial crisis in 2008 and 2009. Therefore it is vital to study and analyze the on-going Malaysia-OIC trade relationship in this context. Figure1.1 shows the Malaysian trade with other OIC countries.

The purpose of this study is to examine the impact of macroeconomic factors i.e. GDP, CPI, TRGDP and ER on exports between Malaysia and other OIC countries using a panel data from 1997 – 2012. The results of this study will reveal whether all variables have impact on exports between Malaysia and other OIC countries, therefore appropriate policies can be implemented by the government. According to author’s best knowledge this is one of the pioneer study which probe the relationship between Malaysian exports and other macroeconomic variables of Malaysia and other OIC members countries. Furthermore, applying recently developed Fully Modify OLS for long run and short run relationship and recent time period from 1997-2012 are also be the contribution of this study.

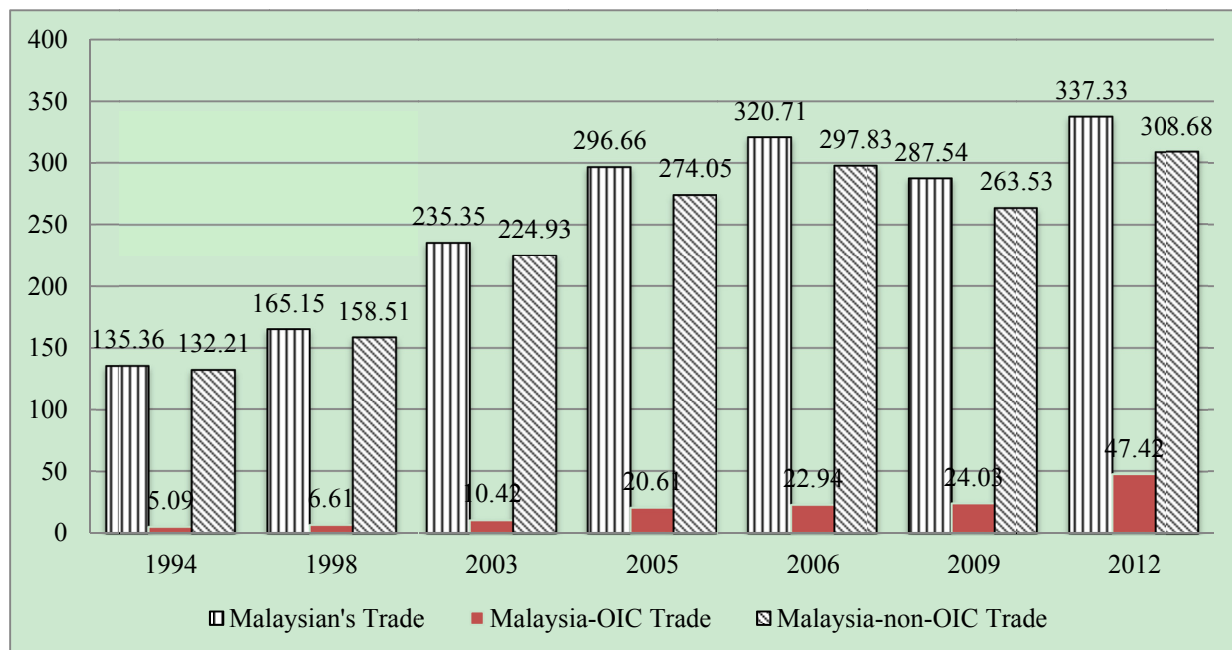


Figure 1. Malaysia-OIC Trade for the Year 1998, 2003, 2005, 2006, 2009, and 2012

Source: <http://www.carsim.ir/icmroot/public/Statistics/OIC-View.htm>. Retrieved on 29 September 2013.

The rest of the paper is outlined as follows. Section 2 provides the review of pervious literature based on international trade, exports and intra-OIC exports. Section 3 discusses theoretical framework followed by empirical data used and methodology in section 4. Empirical results are presented in section 5. Section 6 concludes.

2. Literature Review

Exports plays very important role in the economic development. Numerous studies such as Ekholm, Torstensson, and Torstensson (1996); Bendjilali (2000); Al-Atrash and Yousef (2000); Nugent and Miniesy (2006) Ghani (2007), ABU-HUSSIN (2010) and Haseeb, Hariyat Hartani, Abu Bakar, Azam, and Hassan (2014) have pay attention on the Middle East and North African (MENA) region, which embrace the immensity of OIC members. Moreover, K. Hassan (2002) and Gundogdu (2009) focused on South Asian Association for Regional Cooperation (SAARC). The proposed studies on MENA and OIC countries illustrate that trade dimensions for countries in these regions are small, and categorize the small intensity of trade related services, a lack of trade related information, the subsistence of tariff and non-tariff obstacle, and vacant of trade structures as barriers to regional cooperation and trade. These countries' unbalanced and contracted exports bases also offer slight encouragement to prospective regional partners in term of ascertain long-term economic associations.

The proposed studies on MENA and OIC countries illustrate that trade dimensions for countries in these regions are small, and categorize the small intensity of trade related services, a lack of trade related information, the subsistence of tariff and non-tariff obstacle, and vacant of trade structures as barriers to regional cooperation and trade. These countries' unbalanced and contracted exports bases also offer slight encouragement to prospective regional partners in term of ascertain long-term economic associations. The study of Haseeb et al. (2014) investigates the relationship between exports and economic growth of Malaysia during 1971-2013. The results of Autoregressive Distributed Lag Model (ARDL) explore that exports have statistically positive and significant effects on the economic growth of Malaysia.

Additionally, these OIC members' countries reliance on non-OIC members' countries for imports and exports. Ekholm et al. (1996) use cross-sectional data for 11- developing countries and 13- industrial countries and argue that impending for trade growth inside the MENA regions, even with the more peaceful countries, and the European Union (EU) is small. Bendjilali (2000) explore the situation of intra-trade between OIC member countries by using gravity model. The results of the study shows that trade of OIC countries positively exaggerated by the size of their economies, the degree of IDB trade financing and their mutual involvement in regional integration schemes. While trade of OIC countries negatively affected by communication and

transportation costs as proxy for the distance factor which constitutes a significant barrier to trade among OIC countries.

Ghani (2007) used Tobit procedure to explore the effects of trade among members of Arab Maghreb Union (AMU) and the members of Gulf Cooperation Council (GCC). The results show that effects are negative, which is patently unusual from estimates for other free trade agreements (FTA). Utilizing cross-country regressions, M. K. Hassan, Sanchez, and Hussain (2010) demonstrate that trade openness has a positive and significant impact on growth for many countries, the effect has been smaller.

ABU-HUSSIN (2010) also explore the scope of economic integration between five members of the Arab States (LAS) and include five of their major partners; the results show that the LAS economic alliance has not been effectual in cause trade growth, representing a collapse of its members to instate integrative procedures. Meanwhile, Hassan (2001) examines the role of exports towards development in SAARC countries. He argue that SAARC countries need trade rectification to boost trade among them because the size of trade between SAARC countries is small as compare to trade with non-SAARC countries. K. Hassan (2002) investigate Malaysia- OIC trade using gravity model approach from the period 1980-2006. The empirical results of this study claim that GDP of Malaysia and OIC countries, exchange rate, foreign direct investment (FDI) and distance are the major determinants of exports in Malaysia.

3. Analytical Framework and Data Source

There are number of studies that estimate export equations for OIC. However, since there have been many economic changes in the world generally, and in OIC, in particular, a re-examination, using the latest data available, and employing the current econometric techniques, is essential. Therefore, the purpose of this section is to develop the following model of exports in which all the methodological issues concerning the exports equation estimation will be taken into consideration.

3.1 Model Specification

We specify the following equation to analyze the effects macroeconomic factors on exports between Malaysia and other OIC countries;

$$\ln Export_{it} = \alpha_i + \beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} + \beta_3 \ln CPI_{it} + \beta_4 \ln CPI_{jt} + \beta_5 \ln ER_{it} + \beta_6 \ln ER_{jt} + \beta_7 \ln TRGDP_{it} + \beta_8 \ln TRGDP_{jt} + \varepsilon_t \quad (1)$$

where

Export _{it}	=	Exports from Malaysia to other OIC countries
GDP _{it}	=	Gross Domestic Product of Malaysia
GDP _{jt}	=	Gross Domestic Product of other OIC countries
CPI _{it}	=	Consumer Price Index of Malaysia
CPI _{jt}	=	Consumer Price Index of other OIC countries
ER _{it}	=	Real Exchange rate of Malaysia
ER _{jt}	=	Real Exchange rate of other OIC countries
TRGDP _{it}	=	Trade contribution in the GDP of Malaysia
TRGDP _{jt}	=	Trade contribution in the GDP of other OIC countries
B	=	Coefficient
ε _t	=	Error term

3.2 Data Sources

The annual time series data of Malaysia and other 54-OIC countries has been selected from various sources. The data of real Gross Domestic Product, Consumer Price Index, Trade contribution in the GDP and real exchange rate of Malaysia and other OIC member countries from the year 1997 to 2012 was taken from World Development Indicator (WDI). Whereas, data of Malaysian exports with other OIC countries are taken from the Direction of Trade Statistics, CD-ROM database and website of International Monetary Fund (IMF).

3.3 Estimation Method

There are several econometric techniques for panel data analysis. This study will apply Fully Modify OLS proposed by Pedroni (2001) to confirm the long run relationship between selected macroeconomic variables of

Malaysia and other OIC countries. To investigate the long run and short relationship overall six different steps have been applied. First, to confirm the stationarity and order of integration panel unit root test such as Maddala and Wu (1999); Levin et al. (2002) and Im et al. (2003) are utilized. There is assumption for FMOLS that all variables must be stationary at level I (0) or at first difference I (1). For the time series data it is possible to analysis the mixture of level I (0) and first difference I (0) variables by applying Autoregressive Distributed Lag Model (ARDL) but unfortunately there is none econometric technique has been developed to analysis the mixture variables in panel data. Second, assume that all the variables are stationary at level I (0) or at first difference I (1). The panel cointegration approach proposed by Kao (1999) will applied to examine the residual based cointegration among proposed variables. Third, after confirm the order of stationarity and cointegration the FMOLS technique has utilized to investigate the long run relationship between the proposed variables. It is observed that the long run relationship results from FMOLS some time show spurious results. To confirm the results are not spurious fourth step to used unit root tests of the residuals of FMOLS model without trend and intercept formation. Fifth, explore the short run relationship by applied panel Error Correction Model (panel ECM).

3.4 Panel Unit Root Test

The available literature such as Phillips and Perron (1988) and Dickey and Fuller (1979) provide the unit root test for the individual and time series data. These tests are suffering with several problems especially have low power against the alternative of stationarity of the series, especially if the sample size is small. The panel unit root test such as Im et al. (2003); Levin et al. (2002) and Maddala and Wu (1999) have numerous advantages. For example, these tests are provide large no of point data, increase the value of degree of freedom and reduce multicollinearity between the two regressors. Panel unit root can written as follow:

$$\Delta X_{it} = \alpha_i + \beta_i X_{i,t-1} + \sum_{k=1}^{n_i} \rho_{ij} \Delta X_{i,t-j} + \varepsilon_{it} \quad i=1, \dots, N, t=1, \dots, T \quad (2)$$

where

Δ	=	First difference
X_{it}	=	current panel of Malaysian series
t	=	Time period
n_i	=	No of lags
ε_{it}	=	Distributed random variables

3.5 Panel Cointegration Approach

After examine the unit root test if the results shows that all the variables are stationary at same level Kao (1999) panel cointegration will applied. The model for panel cointegration can be written as follow:

$$X_{it} = \alpha_i + Y_{it} \beta + \omega_{it} \quad (3)$$

where

i	=	1...N
t	=	1...T
ε_i	=	Represent the individual constant term
B	=	Stand for slop parameter
ω_i	=	Shows stationary distribution
X_{it} and Y_{it}	=	Presented integrated process of order I (1) for all i

Kao (1999) drives two types (Dickey & Fuller, 1979; Phillips & Perron, 1988) of panel cointegration tests. Both test can be written as follow

$$\varpi_{it} = \rho \varpi_{it-1} + V_{it} \quad (4)$$

and

$$\varpi_{it} = \rho \varpi_{it-1} + \sum_{j=1}^{\rho} \phi_j \Delta \varpi_{it-j} + V_{it} \quad (5)$$

where ϖ_{it-1} obtained from Equation (2). For null hypothesis $H_0 : \rho = 1$ and alternative hypothesis $H_1 : \rho < 1$ is used.

3.6 Fully Modify OLS

As mentioned earlier to explore the long run relationship it is important to confirm the stationarity level and cointegration. At this stage study assume that all the variables are stationary and there is cointegration the long run relationship test FMOLS proposed by Pedroni (2001) has been applied. Let Equation (2), can obtain the between-dimension Equation (5)

$$\varpi_{GFM} = N^{-1} \sum_{i=1}^N \left[\sum_{t=1}^T (X_{it} - X'_{it})^2 \right]^{-1} \left[\sum_{t=1}^T (X_{it} - X'_{it}) Y'_{it} - Tr'_{it} \right] \tag{6}$$

where $\varpi_{GFM} = N^{-1} \sum_{i=1}^N \varpi_{FMI} \cdot \varpi_{FMI}$ is the FMOLS estimator for individual variable.

3.7 Panel Error Correction Model (Panel ECM)

Furthermore, a panel ECM were applied to analyze the short-run relationship among variables. A panel ECM model is specified as follows;

$$\begin{aligned} \Delta \ln Export_{it} = & \mu_i + \sum_{j=1}^{11} \delta_j D_{jit} + \sum_{j=1}^p \phi_{1j} \Delta \ln GDP_{it-j} + \sum_{j=0}^p \phi_{2j} \Delta \ln GDP_{jt-j} + \sum_{j=1}^p \phi_{3j} \Delta \ln CPI_{it-j} \\ & + \sum_{j=0}^p \phi_{4j} \Delta \ln CPI_{jt-j} + \sum_{j=0}^p \phi_{5j} \Delta \ln ER_{it-j} + \sum_{j=0}^p \phi_{6j} \Delta \ln ER_{jt-j} + \sum_{j=0}^p \phi_{7j} \Delta \ln TRGDP_{it-j} \\ & + \sum_{j=0}^p \phi_{8j} \Delta \ln TRGDP_{jt-j} + \lambda \varepsilon_{it-1} \end{aligned} \tag{7}$$

4. Empirical Results

4.1 Panel Unit Root Results

The panel unit root test results are presented in Table1. The results based on various (Dickey & Fuller, 1979; Im et al., 2003; Levin et al., 2002; Phillips & Perron, 1988) tests are suggested that all the variables are stationary at level but after taking first difference all variables become non-stationary and significant at 5% critical value.

Table 1. Unit Root Test Results

Panel A	Level	First Difference	Panel B:	Level	First Difference
<i>LNCPI_{it}</i>	0.02*		<i>LNCPI_{it}</i>	1.00	0.00*
<i>LNCPI_{it}</i>	0.99	0.01*	<i>LNCPI_{it}</i>	1.00	0.00*
<i>LNER_{it}</i>	1.00	1.00*	<i>LNER_{it}</i>	0.01*	
<i>LNCPI_{it}</i>	0.08	0.00*	<i>LNCPI_{it}</i>	0.72	0.00*
<i>LNEXPORT_{it}</i>	1.00	0.00*	<i>LNEXPORT_{it}</i>	1.00	0.00*
<i>LNGDP_{it}</i>	1.00	0.00*	<i>LNGDP_{it}</i>	1.00	0.00*
<i>LNGDP_{it}</i>	0.40	0.00*	<i>LNGDP_{it}</i>	1.00	0.00*
<i>LNTRGDP_{it}</i>	1.00	0.00*	<i>LNTRGDP_{it}</i>	1.00	0.00*
<i>LNTRGDP_{it}</i>	0.03*		<i>LNTRGDP_{it}</i>	0.37	0.00*
Panel C:			Panel D:		
<i>LNCPI_{it}</i>	1.00	0.00*	<i>LNCPI_{it}</i>	1.00	0.00*
<i>LNCPI_{it}</i>	0.99	0.00*	<i>LNCPI_{it}</i>	0.12	0.00*
<i>LNER_{it}</i>	0.02*		<i>LNER_{it}</i>	1.00	0.00*
<i>LNCPI_{it}</i>	0.62	0.00*	<i>LNCPI_{it}</i>	0.73	0.00*
<i>LNEXPORT_{it}</i>	1.00	0.00*	<i>LNEXPORT_{it}</i>	1.00	0.00*
<i>LNGDP_{it}</i>	1.00	0.00*	<i>LNGDP_{it}</i>	1.00	0.00*
<i>LNGDP_{it}</i>	1.00	0.00*	<i>LNGDP_{it}</i>	1.00	0.00*
<i>LNTRGDP_{it}</i>	1.00	0.00*	<i>LNTRGDP_{it}</i>	1.00	0.00*
<i>LNTRGDP_{it}</i>	1.00	0.00*	<i>LNTRGDP_{it}</i>	1.00	0.00*

Note: panel A consist on (Levin et al., 2002); panel B consist on (Im et al., 2003); Panel C consist on (Dickey & Fuller, 1979), panel C consist on (Phillips & Perron, 1988); *denoted significant at 1 percent critical value

The unit root test results presented in the above Table are based on different tests. The decision of stationarity based on the majority decision. According to overall results all the variables are stationary at first difference. There is no evidence of mixture of stationary at level I (0) and I(1) or stationary at second difference I (2). Consequently, these results are allowed to proceed further for Kao cointegration test and FMOLS long run relationship test.

4.2 Panel Cointegration Test Results

To investigate the panel cointegration Kao (1999) test has been applied. The results of panel Kao cointegration are reported in Table 2. The results show that Malaysian exports and other macroeconomic variables of Malaysia and other 54-OIC countries are cointegrated within the panel of proposed countries.

Table 2. Cointegration Test Result based on Kao (1999)

Test	<i>t</i> -Statistic	P-Value
ADF	-5.766596	0.0000

According to given p-value there is significant cointegration between proposed variables.

4.3 FMOLS Results

Based on the previous results it is confirmed that all variables; export, GDP_i , GDP_j , $PCGDP_i$, CPI_i , CPI_j , ER_i , ER_j , $TRGDP_i$, $TRGDP_j$ are cointegrated. We then proceed to analyze whether there exist a long run relationship between variables using a panel cointegration technique. The results of FMOLS are reported in Table 3.

Table 3. FMOLS Test

Variables	Coefficient	Std. Error	<i>t</i> -Value	P-Value
$LNGDP_i$	19.48493	6.647995	-2.930948	0.0039*
$LNGDP_j$	1.451818	2.395304	0.606110	0.5453
$LNTRGDP_i$	9.378233	3.113720	3.011907	0.0030*
$LNTRGDP_j$	0.290620	0.809078	0.359199	0.7199
$LNCPI_i$	12.19262	7.918930	1.539681	0.1256
$LNCPI_j$	3.054546	1.860290	1.641973	0.1026
$LNER_i$	13.28256	2.662923	4.987962	0.0000*
$LNER_j$	-0.529118	0.976545	-0.541827	0.5887

*denote significant at 5 percent

The results presented in the Table 3 variables such as GDP_i , $TRGDP_i$ and ER_i has significant positive effect on exports.

4.4 FMOLS Residual Test

Table 4. Results of FMOLS Residual

Test	LEVEL		FIRST DIFFERENCE	
	t-statistics	p-values	t-statistic	p-value
(Levin et al., 2002)	-6.563	000	-12.094	000
(Dickey & Fuller, 1979)	96.940	000	162.22	000
(Phillips & Perron, 1988)	95.989	000	183.15	000

The results show that long run results are not spurious.

4.5 Panel ECM Model

A panel ECM is then applied to examine the short-run relationships among all variables. Results of panel ECM are reported in Table 5.

Table 5. Panel ECM (dependent variable $\Delta LNEXPORT$)

Variables	Coef	Std. Err	<i>t</i> -Value	P-Value
$\Delta LNGDP_i$	4.832153	3.473523	1.391139	0.1660
$\Delta LNGDP_j$	0.204775	1.722519	0.118881	0.9055
$\Delta LNTRGDP_i$	7.108162	1.760562	4.037439	0.0001*
$\Delta LNTRGDP_j$	0.337664	0.590847	0.571492	0.5684
$\Delta LNCPI_i$	-5.71345	5.485602	-1.041535	0.2991
$\Delta LNCPI_j$	0.924390	1.316117	0.702362	0.4834
$\Delta LNER_i$	12.51135	1.908178	6.556703	0.0000*
$\Delta LNER_j$	-0.23278	0.732809	-0.317654	0.7511
ECM(-1)	-0.441938	0.057155	-7.732232	0.0000*
C	0.264826	0.203579	1.300852	0.1950

The short run results are presented in Table 4 shows that 1 % disequilibrium increase exports by 0.44 percent so it takes 2.27 time periods to restore the equilibrium. From the short run variables it is observed that there are ER and TRGDP positively causing exports in short run.

5. Conclusions

This paper examines the role of macroeconomic factor in influencing exports between Malaysia and other OIC countries during the 1997-2012. First the panel unit root tests such as Levin, Lin & Chu (2002), Im, Pesaran & Shin (2003), ADF Fisher Chi Square and (Phillips & Perron, 1988) Chi Square was applied. The results indicate that all the variables are stationary at first difference. Furthermore, Koa (1999) test confirm the cointegration among proposed variables. Study found that all variables are cointegrated within the panel of 55-OIC countries. In addition the FMOLS results confirmed that a long run relationship exists between all variables. By using a panel ECM model, it is revealed that ER and TRGDP positively influencing exports in the short run. Therefore in order to continue and increase competition on exports, it is crucial for Malaysia to formulate policies regarding to exchange rate and trade.

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