CAUSAL RELATIONSHIP BETWEEN EXPORTS AND PRIVATE FINAL CONSUMPTION EXPENDITURE TO THE ECONOMIC GROWTH IN MALAYSIA

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ABSTRAK

Perbelanjaan penggunaan akhir swasta dan eksport adalah antara faktor yang mempengaruhi pembentukan Keluaran Dalam Negeri Kasar (KDNK), mengikut kaedah perbelanjaan. Tujuan kertas ini disediakan adalah untuk mengkaji hubungan kausal antara eksport dan perbelanjaan penggunaan akhir swasta terhadap pertumbuhan ekonomi dengan menggunakan ujian Johansen Cointegration dan Granger causality. Data siri masa suku tahunan bagi variable eksport, perbelanjaan penggunaan akhir swasta dan KDNK bagi suku pertama 2010 sehingga suku kedua 2018 telah digunakan dalam analisis ini. Ujian hubung kait jangka panjang dan jangka pendek antara semua variable tersebut telah dijalankan. Melalui kajian ini, dibuktikan bahawa perbelanjaan penggunaan akhir swasta dan eksport mempunyai kesan positif dan mempunyai hubungan dalam tempoh jangka panjang dan jangka pendek dengan pertumbuhan ekonomi. Oleh itu, kajian ini memberi pengesahan kukuh bahawa perbelanjaan penggunaan akhir swasta dan eksport di Malaysia mendorong pertumbuhan ekonomi dalam tempoh kajian. Kajian ini mencadangkan supaya polisi yang digubal memberi fokus untuk meningkatkan perbelanjaan penggunaan akhir swasta dan eksport supaya keseluruhan ekonomi berkembang dengan momentum lebih kukuh.

Kata kunci: Eksport barangan, Eksport perkhidmatan, Pertumbuhan ekonomi, KDNK, Cointegration, VAR dan Causality

ABSTRACT

The private final consumption expenditure and exports are among the factors that influence the formation of the Gross Domestic Product (GDP), according to the expenditure method. This paper aims to study the causal relationship between exports and private final consumption expenditure to the economic growth by employing Johansen Cointegration and Granger causality test. Quarterly time series data for the variables of exports, private final consumption expenditure and GDP for first quarter 2010 until second quarter 2018 were used in this analysis. The tests on the long run and short run relationship between those variables were also conducted. In this study, it was confirmed that the private final consumption expenditure and exports positively affect the economic growth and moves with the economic growth in the long run and short run. Thus, this study strongly confirmed that the consumption expenditure and exports in Malaysia induces the economic growth over the sample period. Therefore, this study recommends that the policy to focus on boosting the private final

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consumption expenditure and exports, so as make the overall economy grow at a stronger momentum.

Keywords: Exports goods, Exports services, Economic growth, GDP, Cointegration, VAR and Causality

1. INTRODUCTION

Economic growth is one of the most important determinant of economic welfare. The relationship between exports and economic growth is a frequent topic of discussion, especially in explaining the different levels of economic growth between countries. Exports of goods and services represent one of the most important sources of foreign exchange income that ease the pressure on the balance of payments and create employment opportunities. The GDP is seen as one of the main macro-economical aggregates, specific to the System of National Accounts, which represents the synthetic expression of the results of economic activity produced within the economic territory during a time interval, regardless the contribution of the internal or foreign subjects.

GDP based on expenditure approach is the summation of Private Final Consumption Expenditure (PFCE), government final consumption, gross fixed capital formation, changes in inventories and valuables, exports of goods and services minus imports of goods and services. All these components are categorised as 'final demand' or 'final expenditure'. The PFCE is defined as the expenditure incurred on final consumption of goods and services by the resident households and Non-Profit Institutions Serving Households (NPISH).

There is much empirical evidence corroborating the fact that exports foster economic growth, both for industrialised and for developing countries. Liberalising and striving towards the integration into the global markets has thus become a standard precept inspiring trade policy reforms. It is known that exports are seen as an engine of economic and social development because of their ability to influence economic growth and poverty reduction.

Malaysia has enjoyed one of the best economic growth records in Asia over the last five decades despite a multitude of challenges and economic shocks. The economy achieved a stable real GDP growth since 1970, successfully transforming from a predominantly agriculture-based economy in the 1970s, to manufacturing in the mid-1980s, and to modern services in the 1990s.

Malaysia rose from the ranks of a low-income economy in the 1970s to a high middle-income economy in 1992 and remains so today. Malaysia’s national per capita income expanded from RM3,900 (1981) to RM41,093 (2017).

In second quarter 2018, the Malaysia's economy grew by 4.5 per cent (Q1 2018: 5.4 per cent). The decline in Agriculture and Mining & Quarrying sectors have weighed down the overall performance of GDP. The Services sector supported the GDP with a sustained growth of 6.5 per cent during the second quarter 2018. The growth in Services sector was underpinned by Wholesale & retail trade which recorded a higher growth of 7.3 per cent fuelled by higher household’s spending.

On expenditure side, PFCE rose to 8.0 per cent driven by higher consumption on Food & beverages, Communication and Restaurants & hotels. Few key events such as fasting month, Hari Raya Aidilfitri and zerorisation of Goods & Services Tax (GST) in the second quarter 2018 have played a role in the expansion of PFCE.

Exports of goods in the second quarter of 2018 were valued at RM245.0 billion recording a growth of 8.2 per cent. The main products which contributed to the increase were Electrical and Electronic (E&E) products which advanced 9.8 per cent or RM8.1 billion to RM90.9 billion followed by refined petroleum products which rose strongly by 25.9 per cent and crude petroleum with a robust 31.2 per cent increase. However, two other major export products namely palm-oil & palm-oil based products which decreased by 12.0 per cent and Liquefied Natural Gas (LNG) which fell 5.1 per cent.

Meanwhile, exports of services for second quarter 2018 amounted to RM39.0 billion (Q1 2018: RM38.3 billion) registering a decline of 2.8 per cent on year-on-year basis. The decrease was mainly contributed by a drop in Travel subcomponents (7.4 per cent) due to lower inbound tourist to Malaysia.

The aim of this study is to investigate the relationship between PFCE, exports of goods and exports services to economic growth of Malaysia, through employing quarterly data from the period of first quarter 2010 until second quarter 2018.

In particular, this paper tries to empirically find an answer for the question of whether PFCE lead economic growth and whether exports goods or exports services given the biggest impact to economic growth or vice versa. The paper is structured as follows; next in Section 2, this study presents the review of literature concerning the nexus between exports, private final consumption expenditure and economic growth. The following Section 3, discusses the methodology, model specification and data used in this study. Section 4 presents the empirical results as well as the analysis of the findings. Finally, Section 5 is dedicated to the conclusion.

2. LITERATURE REVIEW

Many literatures have examined the relationship between private final consumption, exports and economic growth. A variety of studies shows different results about the relationship of these three variables.

Bédia F. Aka (2006) examined the relationships between openness, globalisation on economic growth in Côte d'Ivoire for the period 1960-2005. The empirical results show by using VAR model that increasing openness has a positive impact on Côte d'Ivoire's economic growth in the short but not in long-run.

Mehdi Taghavi, Masoumeh Goudarzi, Elham Masoudi and Hadi Parhizi Gashti (2012) studied the impact of exports and imports on economic growth in Iran over the period 1962-2011. Johansson's cointegration test, error correction model, impulse response function and Variance Decomposition were employed in the empirical

analysis. The results show that there is a long run relationship between exports, imports and economic growth. Based on results, exports had direct and positive relationship with economic growth in long run. However, imports had a negative relationship with economic growth in long-term.

Khairul Hashim and Mansur Masih (2014) examined the relationship between trade and economic growth in Malaysia by using Granger causality test and impulse response functions to examine whether growth in trade stimulates economic growth. The results confirm the bidirectional long run relationships between the economic growth and exports, economic growth and imports and exports and imports.

Abugamea (2015) examined the link between exports, imports and economic growth in Palestine through employing yearly data for the period 1968-2012. The results, based on Vector Error Correction model show the existence of the long run relationship between imports and economic growth given exports stationary. Moreover, both exports and imports are considered main determinants of economic growth in Palestine. Granger causality test shows no causality among exports and imports and economic growth. Mainly, causality tests confirm VECM results that import cause changes on economic growth in the long run but not in the short run.

Sachin N. Mehta (2015) tested the relationship between exports, imports and economic growth in India by using annual data for the period 1976-2014. Engle Granger Cointegration analysis, VECM and Granger causality tests were employed in the empirical analysis. The results show that there is a long run co-integrating relationship between GDP, exports and imports in India. In long term the results of Granger causality tests show that GDP leads to exports but exports does not lead to GDP, also GDP does not lead to imports and imports do not lead to GDP. Finally exports lead to imports but imports do not lead to exports.

Sani Hassan Hussaini, Bashir Ado Abdullahi, Musa Abba Mahmud (2015) examined the relationship between exports, imports and economic growth in India. They found that exports, imports and economic growth are cointegrated and there exist bidirectional relationship between GDP and exports.

Masoud Albiman Md and Suleiman NN (2016) investigated the nexus between exports, imports and economic growth in Malaysia, using annual data for the period 1967-2010. Cointegration analysis, VAR and Granger causality tests were employed in the empirical analysis. The results show that there is a causal relationship from exports to economic growth and from exports to imports.

Sakib bin Amin (2011) investigated the causal relationship between consumption expenditure and economic growth in Bangladesh, using annual data for the period 1976-2009. Using Johansen cointegration method and ARDL cointegration method, the empirical findings indicate that there exists long run cointegration between the concerned variables.

A. L. Mohamed Aslam (2017) investigated the impact of household expenditure on the economic growth using linear multiple regression model with support of ordinary least squares (OLS) technique and Johansen cointegration by employing annual time series data for the period of 1975 to 2014. This study found that the household

expenditure had positive relation on the GDP in Sri Lanka and had long – run relationship on the GDP.

Zulkefly Abdul Karim, Bakri Abdul Karim and Mohd Azlan Shah Zaidi (2012) examined the dynamic linkages between economic growth, fixed investment and household consumption in Malaysia using a Structural Vector Error Correction Model (SVECM) approach. Time series data from first quarter 1991 up to second quarter 2010 was used. The empirical results revealed that household consumption and fixed investment are significant in influencing the output growth in the short run. This finding tends to support the alternative view of growth hypothesis, namely fixed investment-led growth, and household consumption-led growth in the short run. In the long run, there is no significant effect of fixed investment and household consumption on growth. However, in the long run, there is a permanent effect of economic growth on household consumption and investment.

3. DATA, METHODOLOGY AND MODEL SPECIFICATION

3.1 Data

The study used quarterly time series data during the period of first quarter 2010 to second quarter 2018 or 34 observations which should be sufficient to capture the short run and long run correlation between PFCE, exports and economic growth in the model. The data used are in constant value. All data set are taken from Department of Statistics Malaysia. Data analysis was done by using EViews.

3.2 Methodology

Since the study uses variables in the form of time series, it is necessary to ascertain their stationary, hence the need to carry out tests of stationarity to determine the degree of integration of variables, among the various tests of verification of stationary that exist. The study retains the unit root tests Augmented Dickey Fuller (ADF) and Phillips-Perron (PP). If the variables are all integrated in level, the estimation based on a linear regression will be applied. On the other hand, if the variables are all integrated into the first difference, estimation will be based on an estimate of the Vector Autoregression (VAR) model. When the variables are integrated in the first difference, the cointegration between the variables will be examined and determined. If the cointegration test indicates the absence of cointegration relation, VAR model will be used. If the cointegration test indicates the presence of a cointegration relation between the different variables studied, the Vector Error Correction Model (VECM) will be applied.

3.3 Model specification:

The considered function and multiple regression model of this study are as follows:

$$GDP_t = f\,(EG_t, ES_t, PFCE_t, CE_t) \quad (1)$$

The function can also be represented in a log-linear econometric format thus:

$$\log(GDP_t) = \beta_0 + \beta_1 \log(EG_t) + \beta_2 \log(ES_t) + \beta_3(PFCE_t) + \beta_4 \log(CE_t) + \varepsilon_t \quad (2)$$

Where:

GDP : Gross domestic product
EG : Exports goods
ES : Exports services
PFCE : Private final consumption expenditure
CE : Currency exchange
β_0 : The constant term
β_1 : coefficient of variable (EG)
β_2 : coefficient of variables (ES)
β_3 : coefficient of variables (PFCE)
β_4 : coefficient of variables (CE)
t : The time trend
ε : The random error term assumed to be normally, identically and independently distributed

The inclusion of exchange rate in the model was to reflect the price competitiveness at international level according to Henriques and Sadorsky (1996) while Al-Yousif (1999) said the exchange rate has a direct influence on economic performance via export channel.

To validate the multiple regression model of this study, R-squared, F-statistics and Durbin Watson statistics were considered, and also to confirm the serial correlation effect of the estimated model, the Breusch-Godfrey serial correlation test was employed. Moreover, to test the impact of fiscal imbalance in this study, the coefficient of households' expenditure and exports in the estimated model and its probability were used.

In order to examine the long and short run relationship, the following analytical techniques such as unit root test, cointegration test and VECM techniques were employed. In this study, to test the stationarity of the variables, the ADF and PP tests were applied. In order to select the optimum lag equation, this study used the Akaike Information Criterion (AIC) and Schwartz Bayesian Information Criterion (SBIC). As stated earlier, to test the long run relationship between the variables, the Johansen and Juselius cointegration test was employed that can be written as:

$$\begin{pmatrix} \Delta Yt \\ \Delta Xt \\ \Delta Wt \end{pmatrix} = \Gamma_1 \begin{pmatrix} \Delta Yt-1 \\ \Delta Xt-1 \\ \Delta Wt-1 \end{pmatrix} + \Pi \begin{pmatrix} \Delta Yt-1 \\ \Delta Xt-1 \\ \Delta Wt-1 \end{pmatrix} + \varepsilon_t$$

According to cointegration analysis, when two variables are cointegrated then there is at least one direction of causality. Therefore, the long run relationship between exports good and services and PFCE to economic growth in Malaysia was tested using the above cointegration VAR model. This cointegrating vector was derived from two likelihood ratio tests, namely, Trace test and Maximum Eigen value test. Both approaches are limited as;

i. Trace test

$$\lambda_{trace} = -2lnQ = -T_i \sum ln\,(1 - \lambda_t)$$

ii. Maximum Eigen value test

$$\lambda_{Max} = -2ln\,(Q : r \mid r + 1) = -Tln \sum ln\,(1 - \lambda_{t+1})$$

Trace statistics investigates the null hypothesis of "r" cointegrating relations against the alternative of 'n' cointegrating relation, where 'n' is the number of variables in the system equation for r = 0, 1,…… n-1. Maximum Eigen value investigates the null hypothesis of "r" cointegrating vectors that are tested against the alternative hypothesis of "r+1"cointegrating vectors. After identifying the number of cointegration equation, the VECM was employed to test the long run model among the dependent and independent variables and the short run disequilibrium. For this purpose, this study considers the following VAR model with different lags. The VAR model with different lags is written as follows;

$$Y_t = V + A_1 Y_{t-1} + A_2 Y_{t-2} \ldots\ldots\ldots A_i Y_{t-i} + \mu_t$$

Where: Y_t is a (K x 1) vector variable, V is a (Kx1) vector of parameters. A_1 …..A_i are (K x K) matrices of parameters and μ_t is a (Kx1) vector of disturbances having zero mean and sum of covariance matrix is identically and independently distributed over a time. Any VAR model can be rewritten as vector error correction by using some algebra which can be expressed as;

$$\Delta Y_t = V + \Pi Y_{t-1} + \sum_{i-1}^{p-1} \Phi_i + \Delta Y_{t-i} + \mu_t$$

Where: $\Pi = \sum_{j=1}^{p} A_j - I_k$ and $\Phi_i = -\sum_{j=i+1}^{p} A_j$

If cointegration between the independent and dependent variables has been identified, the VECM can be applied to test the short run properties of the identified cointegration equation. If a set of variables is found to be cointegrated, error correction representation term must be included in the VAR model (Ahmad, 2001).

The direction of Granger causality can only be detected through the VECM derived from the long run cointegrating vectors. The VECM also distinguish between short run and long run Granger causality. The short run causal effect is indicated by t-test of the explanatory variables (in first difference) and for long run causal relationship is determined through the significance of the lagged Error Correction Term (ECT) which contain long run information (Zubaidi and Rashid, 1999). For a simple bivariate system, with one cointegration equation and no lagged differenced terms, the equation is:

$$y_{2,t} = \beta y_{1,t}$$

Thus, the VEC model is:

$\Delta y_{1,t} = \alpha_1(y_{2,t-1} - \beta y_{1,t-1}) + \varepsilon_{1,t}$

$\Delta y_{2,t} = \alpha 2(y_{2,t-1} - \beta y_{1,t-1}) + \varepsilon_{2,t}$

This term, $(y_{i,t-1} - \beta_{yi,t-1})$, represent an error correction term, $\varepsilon_{i,t}$, innovation and α_1 is the speed of adjustment. In the long run, the right hand side variables will be zero. However, VECM will be used if the series is cointegrated and with the same order. In order to test the autocorrelation effect of the VECM, the study used the Breusch – Godfrey Serial correlation Lagrange Multiplier (LM) test.

4. RESULTS AND DISCUSSION

4.1 Correlation Test

To establish how forceful the nexus is between the four variables, the analysis used the Pearson correlation coefficient value.

- If the coefficient value is in the negative range, it indicates the relationship between the variables is negatively correlated, or as one value increases, the other decreases.
- If the coefficient value is in the positive range, it indicates the relationship between the variables is positively correlated, or both value increase or decrease together.

Table 4.1: Correlation Test

	GDP	EG	ES	PFCE
GDP	1	0.8438	0.7887	0.8470
EG	0.8438	1	0.5713	0.7572
ES	0.7887	0.5713	1	0.5409
PFCE	0.8470	0.7572	0.5409	1

The results of the correlation test give us that all the variables studied are positively correlated, that is meant an increase in exports and PFCE directly lead to an increase in the GDP and vice versa.

4.2 Test for unit roots: ADF and PP

Consistent with the appearance of the curves [Log (GDP), Log (EG), Log (ES), Log (PFCE), Log (CE)], it observed according to their general directions at the same time and the same movement, which place their stationary in level. For this reason, it is necessary to test the stationarity of the variables used in the model, in order to check whether or not the stature of a unit root is the same, ADF and PP tests are used.

Table 4.2: Results of Unit Root Tests

Log level form					
Variables	ADF		PP		Stationarity
	t-stat	Probability	t-stat	Probability	
Log(GDP)	-0.4907	0.8793	-1.1714	0.6748	Non-stationary
Log(EG)	-1.4235	0.5589	-1.2544	0.6386	Non-stationary
Log(ES)	-1.8137	0.3669	-3.0156	0.0837	Non-stationary
Log (PFCE)	-1.5654	0.4865	-0.9426	0.7616	Non-stationary
Log (CE)	-0.5427	0.8700	-0.6675	0.8413	Non-stationary

First difference form					
Variables	ADF		PP		Stationarity
	t-stat	Probability	t-stat	Probability	
Log(GDP)	-2.9791	0.0488	-11.1535	0.0000	Stationary
Log(EG)	-6.5110	0.0000	-7.5415	0.0000	Stationary
Log(ES)	-6.7058	0.0000	-12.8911	0.0000	Stationary
Log (PFCE)	-3.3344	0.0227	-12.9552	0.0000	Stationary
Log (CE)	-4.3073	0.0019	-4.2520	0.0022	Stationary

Table 4.2 presents the results of unit root tests from ADF and PP tests. The ADF regression order is based on the highest Schwarz Bayesian Criterion (SBC). The result suggests that all variables (in logarithms) are non-stationary at the level form since t-statistics is lower than critical value, thus the null hypothesis of non-stationary failed to be rejected, i.e. non-stationary is accepted. The variables become stationary on first differences in both ADF and PP tests.

4.3 Cointegration Analysis

Prior to the application of Johansen cointegration, the series should be integrated with the same order. Based on the above result, the cointegration test will be undertaken since all the series are integrated in the same order I(1). To check the cointegration between the variables studied, it is necessary to pass through the two stages. First of all, it is necessary to specify the number of optimal delay which must be suitable for the model. Then, Johansen Test will be used to specify the number of cointegration relationships between variables.

a) VAR Lag Order Selection Criteria

The choice of the number of the delay has a very important role in the design of a VAR model. Most VAR models are estimated to involve symmetric lags, the same lag length is exercised for all variables in all equations of the model. This lag length is frequently picked using an explicit statistical criterion such as the Hannan-Quinn Criterion (HQ), Final Prediction Error (FPE), AIC or Schwarz Information Criterion (SIC).

Table 4.3: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	380.8607	NA	2.03E-17	-24.24908	-24.01779	-24.17369
1	503.3715	197.598	3.85E-20	-30.54009	-29.15237	-30.08773
2	530.1702	34.57903	3.93E-20	-30.65614	-28.11197	-29.82681
3	634.4403	**100.9065***	**3.48e-22***	**-35.77034***	**-32.06973***	**-34.56404***

* indicates lag order selected by the criterion

LR : sequential modified LR test statistic (each test at 5 per cent level)
FPE : Final prediction error
AIC : Akaike information criterion
SIC : Schwarz information criterion
HQ : Hannan-Quinn information criterion

The results of Table 4.3 shows that the number of lags equal led to 3 since the criteria FPE, AIC, SC and HQ select that the number of lags as equal to 3.

b) Cointegration Analysis: Johansen Test

To determine the number of exist cointegration, Johansen test was conducted.

Table 4.4: Cointegration Test

Johansen Test for Co-integration (Trace Test)

Hypothesized No. of CE(s)	Eigen value	Trace Statistic	0.05 Critical Value	Probability**
None *	0.9499	138.6630	69.8188	0
At most 1 *	0.6683	48.7992	47.8561	0.0406
At most 2	0.2847	15.6926	29.7970	0.7337
At most 3	0.1645	5.6388	15.4947	0.7377
At most 4	0.0081	0.2446	3.8414	0.6208

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Johansen Test for Co-integration (Maximum Eigen value Test)

Hypothesized No. of CE(s)	Eigen value	Max-Eigen Statistic	0.05 Critical Value	Probability**
None *	0.9499	89.8637	33.87687	0
At most 1 *	0.6683	33.1066	27.58434	0.0088
At most 2	0.2847	10.0538	21.13162	0.7396
At most 3	0.1645	5.3941	14.2646	0.6915
At most 4	0.0081	0.2446	3.841466	0.6208

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

To specify the number of cointegration relations, the following hypothesis was examined:

- If the statistics of the trace is greater than the value criticized then one rejects H_0 therefore, there exists at least one cointegration relation.
- If the trace statistics is less than the critiqued value, then H_0 is accepted so there is no cointegration relationship.

There are two cointegration relationships, so the error-correction model can be retained.

The Johansen test indicates cointegration relation exist between the variables studied. Therefore, VECM model was used.

c) VECM estimation

After estimating the long-run equilibrium relationship, the equation in the following form will be estimated as an error correction model. The results as per following equation:

D(LogGDP) = C(1)*(LogGDP(-1) - 0.306311575087*LogEG(-1) - 0.5516095855*LogES(-1) - 0.319677020775*LogPFCE(-1) - 0.190995768621*LogCE(-1) + 0.415091939808) + C(2)*D(LogGDP(-1)) + C(3)*D(LogGDP(-2)) + C(4)*D(LogGDP(-3)) + C(5)*D(LogEG (-1)) + C(6)*D(LogEG(-2)) + C(7)*D(LogEG (-3)) + C(8)*D(LogES(-1)) + C(9)*D(LogES(-2)) + C(10)*D(LogES(-3)) + C(11)*D(LogPFCE(-1)) + C(12)*D(LogPFCE(-2)) + C(13)*D(LogPFCE(-3)) + C(14)*D(LogCE(-1)) + C(15)*D(LogCE(-2)) + C(16)*D(LogCE(-3)) + C(17)

Table 4.5: Least Squares (Gauss-Newton / Marquardt steps)

Variables	Coefficient	Standard Error	t- statistics	Prob.
C(1)	-0.463512	0.205087	-2.260078	0.0416
C(2)	-0.334291	0.24368	-1.371846	0.1933
C(3)	-0.867063	0.22517	-3.850698	0.002
C(4)	-0.931426	0.318642	-2.923108	0.0119
C(5)	-0.168475	0.080643	-2.08916	0.0569
C(6)	-0.036136	0.086522	-0.417652	0.683
C(7)	0.005614	0.066158	0.084863	0.9337
C(8)	-0.218344	0.104822	-2.083003	0.0576
C(9)	-0.116411	0.075333	-1.545286	0.1463
C(10)	-0.116824	0.062972	-1.855164	0.0864
C(11)	-0.226883	0.27349	-0.829584	0.4217
C(12)	-0.149046	0.142594	-1.045252	0.315
C(13)	0.078153	0.205698	0.379941	0.7101
C(14)	0.03344	0.050208	0.666029	0.517
C(15)	-0.030404	0.054591	-0.556949	0.587
C(16)	0.001472	0.052183	0.028205	0.9779
C(17)	0.021257	0.00576	3.690329	0.0027

Table 4.5 shows the results of estimating the equation. If the coefficient of the variable C(1) is negative and possesses a significant probability, this means that all variables in the long-term relationship are significant in explaining the dependent variables.

Table 4.6: Long run model and its output

Variables	Coefficient	Standard errors	t- statistics
Log (EG(-1))	-0.306312	-0.0184	-16.5924
Log (ES(-1))	-0.55161	-0.0501	-11.0004
Log (PFCE(-1))	-0.319677	-0.0384	-8.30572
Log (CE(-1))	-0.190996	-0.0235	-8.10868
C	0.415092		

Log(GDP) = 0.306312* Log(EG(-1))+ 0.55161* Log (ES(-1)) + 0.319677* Log (PFCE(-1))+ 0.190996* Log (CE(-1)) - 0.415092

Therefore, this study concludes that the PFCE, exports of goods and services have positive association with the GDP. These prove that in the long run, 1 per cent increase in PFCE leads to an increase of 0.319677 per cent of GDP and 1 per cent increase in exports of goods leads to an increase of 0.306312 per cent of GDP and 1 per cent increase in exports of services may lead to 0.55161 per cent of GDP.

d) Short run Causality test

The dynamic short run causality among the relevant variables is shown in Table 4.7. If the null hypothesis of no causality is rejected, then it can be concluded that a relevant variable Granger-caused economic growth.

Table 4.7: Granger Causality Wald Test

Dependent variable: D(LogGDP)

	Chi-sq	Prob.
D(LogEG)	6.703386	0.0350
D(LogES)	6.004645	0.0497
D(LogPFCE)	25.41236	0.0000
D(LogCE)	2.513617	0.2846
All	53.42151	0.0000

Dependent variable: D(LogEG)

	Chi-sq	Prob.
D(LogGDP)	2.233103	0.3274
D(LogES)	4.843254	0.0888
D(LogPFCE)	7.152188	0.0280
D(LogCE)	1.435449	0.4879
All	19.82741	0.0110

Dependent variable: D(LogES)

	Chi-sq	Prob.
D(LogGDP)	8.872604	0.0118
D(LogEG)	0.853221	0.6527
D(LogPFCE)	7.06015	0.0293
D(LogCE)	9.52451	0.0085
All	28.97058	0.0003

Dependent variable: D(LogPFCE)

	Chi-sq	Prob.
D(LogGDP))	141.7646	0.0000
D(LogEG)	7.213933	0.0271
D(LogPFCE)	7.631563	0.0220
D(LogCE)	1.033779	0.5964
All	443.1338	0.0000

Based on the results, there is short run unidirectional causal relationship running from exports goods to economic growth, bidirectional causal relationship running from exports services to economic growth and bidirectional causal relationship running from private consumption expenditure to economic growth.

e) Residual Diagnostic Test

To verify the empirical work is acceptable and the model estimate is well treated, this study used a set of test called residual diagnostic tests. So as to test the serial correlation effect of the estimated VECM model, this study uses the Breusch-Godfrey Serial Correlation LM Test, Heteroskedasticity Test: Breusch-Pagan-Godfrey and Histogram-Normality Test. The following table shows the results of the explored model.

Table 4.8: Residual Diagnostic Test

Residual Diagnostic Test	
R-squared	0.9866
Adjusted R-squared	0.9702
F-statistic	60.1001
Probability (F-statistic)	0.0000
Durbin-Watson stat	1.8480
Breusch-Godfrey Serial Correlation LM Test:	
F-statistic	0.532067
Obs* R- Squared	4.129458
Prob. F(3,10)	0.670500
Prob. Chi-Square(3)	0.247800
Heteroskedasticity Test: Breusch-Pagan-Godfrey:	
F-statistic	0.961658
Obs* R- Squared	20.436780
Prob. F(20,9)	0.555800
Prob. Chi-Square(20)	0.430900
Normality test:	
Jarque-Bera	0.985578
Probability	0.610920

All residual diagnostic tests are satisfactory and assert that the model is acceptable and well treated (R^2 is greater than 60 per cent, Fisher statistical probability is less than 5 per cent, Breusch-Godfrey Serial Correlation LM Test and Heteroskedasticity Test are superior to 5 per cent) and the model is normally distributed.

5. DISCUSSION AND CONCLUSION

This study examines empirically the causal links between export of goods, exports of services and private final consumption expenditure and economic growth in Malaysia by conducting multivariate time series using time series for the period of first quarter 2010 to second quarter 2018. The correlation analysis, the cointegration analysis, VECM model and the Granger Causality Tests are used here to look into the relationship between those variables in the long run term and in the short run term. According the results, there is a positive impact of exports goods, exports services and private final consumption expenditure on economic growth in the long run term. In the short run, there is an unidirectional causal relationship running from exports goods to economic growth, bidirectional causal relationship running from exports services to economic growth and bidirectional causal relationship running from private consumption expenditure to economic growth. Therefore, this study recommends that the policy to focus on boosting the private final consumption expenditure and exports, so as make the overall economy grow at a stronger momentum.

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