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The Nexus between Foreign Trade and Economic Growth in Myanmar (1988 – 2016)

Sann Linn Aung[1]

Abstract

This paper attempts to reveal the nexus between the foreign trade and economic growth in Myanmar during 1988-2016. In the study, empirical analysis is applied which indicate to use Augmented Dickey-Fuller (ADF) unit root test, the cointegration test and Vector Error Correction Model (VECM). The cointegration test confirms that there exists a long run relationship between the GDP, export and import and the VECM estimation examines that in the long run, export has significant effect on GDP with the positive while import has a negative effect on the GDP. However, both export and import do not significantly associate with GDP in the short run.

Keywords: Export, Import, GDP, Cointegration

[1] Tutor, Department of Applied Economics, Yangon University of Economics, email: sannlinnaung05@gmial.com

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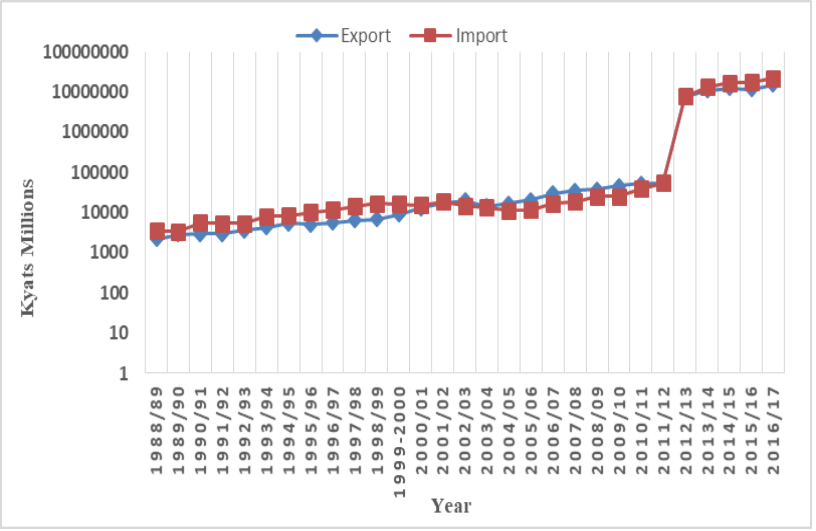
1. Introduction

Foreign trade has been one of the vital activities to boost the economic growth withal every country adopted any economic system. It means that the sector of foreign trade is extensively involving in economic system of countries. So, the nexus between export, import and economic growth has attracted the attention from both researchers and policymakers in developed and developing countries since the early twenty-first century.

Myanmar is one of the developing country including in the least developed countries in the world. In 1988, Myanmar's politics was called the transitional period and economic system was transformed from centrally planned economy to market-oriented system under State Law and Order Restoration Council (SLORC). Economic reforms were performed to recovery the recession in different sector of economy during the socialist period. All efforts are made to encourage the active participation of private sectors in foreign trade and give full support in every angle. After adopted open-economy policy since 1988, integration into the world economy made Myanmar's trade flow has expanded yearly.

Figure (1) Volume of Export and Import



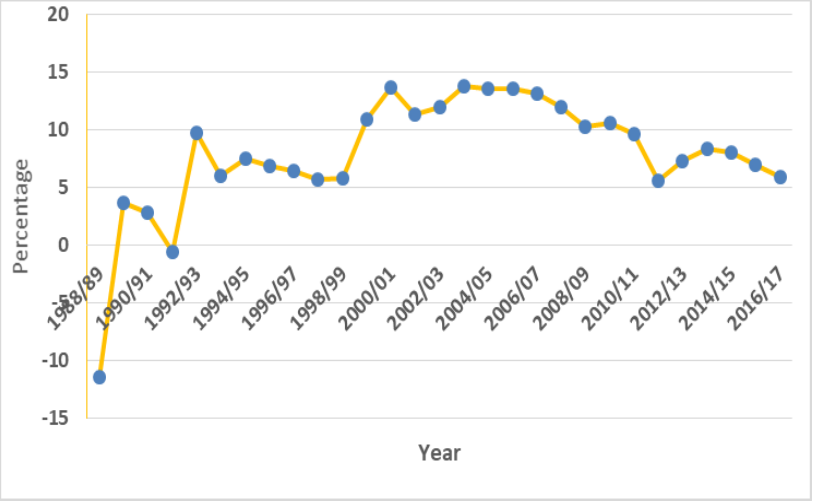
Source: Statistical Yearbook, Myanmar (Various Issues)

In Myanmar, trade deficit has been over the period between 1988 and 2001 under State Peace and Development Council (SPDC) regimes due to adoption of import first, export later principle and the imports of construction raw materials. Soon, trade surplus occurred in trade balance between 2002 and 2011. The reasons were the imposition of import restriction policy, the abolishment of import first, export later rule, adoption of export promotion policy and cultivation and encouragement of being able to export new items which are termed as systematic management of foreign trade system (Nyo, 2000). The result pointed that exports were larger than imports and trade balance signed the surplus and favorable. These trade surpluses driven to economic growth.

In 2011, the emergence of newly elected government also performed economic reforms in trade sector, a number of

trade and investment related laws have been revised and amended or replaced. To adopt the managed floating exchange rate system was dramatically increased trade volume in 2012 but, it was the increase in term of monetary value (Thein, 2004). However, import values were much more than export values which happened trade deficits in 2012/13. The deficits last five fiscal years from 2012/13 to 2016/17. This was the results of liberalization on import restricted regulations which were imposed under SPDC regimes without enough institutionalization (Naing, 2014). The liberalization tended to positive benefit of being able to purchase by the consumers as much as they demanded. On the other hand, the absence of clear and enable policy promoting exports made the condition of trade balance to the downward trend. So, the regulations were no encouragement for economic growth.

Figure (2) Growth Rate of GDP



Source: Statistical Yearbook, Myanmar (Various Issues)

This is the government's official measure of how much output our economy produces. If the increase of national income

in another words, the increase of Gross Domestic Products is the same with the increase in exports, it means the ascending of production of the country. It can also extend to how much increases in the imports. Measuring GDP with imports, it cannot be directly related. It must be described the increase in imports as the result of the increasing in the efficiency of exports. It had better be considered the efficiency of the exports (Maung, 2017).

Myanmar's trade statistics indicated that in 2016/17, export value was 15023161.2 kyats in millions while import value was 21634352.7 kyats in millions and the trade deficit tremendously reached about 6611191.5 kyats in millions. It could be concerned with the trade policies. To deplete that by applying appropriate policies on trade in order to achieve economic growth, can improve economic conditions. Thus, this study aims to explore the relationship between foreign trade and economic growth may support to policymakers to determine the sources of growth and with regard to international trade, adopt appropriate policies.

2. Literature Review

The nexus between foreign trade and economic growth have been explored by many economists from the various point of views. Most of studies are applied by using various econometric methods seek to find out the association between foreign trade indices such as import, export and trade openness and economic growth through one of them focus on the relationship between the growth rate of foreign trade and economic growth. A variety of studies presents the different results about the relationship among them.

The effects of international trade on economic growth focused on the empirical comparison between Portugal and

Netherlands in the period 1970-2010. This analysis was applied ADF test and Phillips-Perron test for unit root and Johansen test for cointegration between the variables include export, import and GDP which are converted to the natural logarithm. Also Vector Error Correction Model was approached. The results provided that the variables in both countries are found the stationary at the first differences and then Johansen cointegration test was confirmed that there was a long run relationship between all the variables. The results provided the strong empirical support for Portugal, both exports and imports play a significant role with the positive effects but for the Netherlands, only exports showed a positive effect on GDP in their economic growth (Antunes, 2012).

The relationship between foreign trade and GDP growth of East China by using the collected 28-year statistical data from 1981 to 2008, this study included the modern testing methods like unit roots, time series cointegration analysis and error correction model for researching the causalities between the total export and total import and GDP growth. The result showed that there exit long term or short term causality between foreign trade and GDP and, total export has a positive relationship with GDP growth was the reason of GDP growth. But there was not exit long term stationary causality between total import and growth of GDP. Finally, this paper provided that development of the foreign trade greatly benefits the economic development in East China (Li, Chen, & San, 2010).

The study of the relationship between foreign trade and economic growth in Turkey used two main methodological approaches. Firstly, econometric analysis based on Vector Autoregressive (VAR) model and Vector Error Correction Model (VECM) by using the annual time series data from 1987

to 2007. This results showed that there is no significant relationship between exports and imports and export was not significantly impacts on economic growth while import was the determinants of economic growth in Turkey. Second, analysis with descriptive statistics during the period 1980-2009 found that the composition changes in foreign trade impacts on the economic growth in Turkey (Kahya, 2011).

The analysis as the impact of trade on economic growth in the Czech and Slovak Republic, ADF test for the unit root and Johansen cointegration test are applied. Also Granger causality test and Vector Error Correction Model was approached. All the variables are integrated the progress of order (1) and then become stationary and according to Johansen test, there has cointegration, that means the long term relationship among the variables exist in both countries. This empirical finding also indicated the important role of export in the economic growth in both countries (Fitzova, H. & Zidek, L., 2015).

The relationship between exports, imports and economic growth in Panama during the period 1980-2015 in which the data are applied by secondary data. In this paper, results were that all data are stationary at first different and there is no cointegration among the variables. In line with VAR model estimation, exports and imports do not have a significant probability. He concluded that exports and imports do not effect on economic growth and it seem as the slightly share of trade sector in economic growth in Panama (Bakari & Mabrouki, 2017).

3. Data and Methodology

3.1) Data

This study focuses the nexus between foreign trade and economic growth is used the annual time series 1988 to 2016 in

Myanmar. It is 29 observations. The data of foreign trade and economic growth in the paper apply the absolute values in Kyats millions. All data set are secondary data and are taken from Central Statistical Organization (CSO), Ministry of Commerce and World Bank Group.

3.2) Methodology

The following theoretical model construct to find out the causal relationship among export, import and economic growth which can be specified as a simple model:

$$GDP = f(export, import) - - - - - - - - (1)$$

Where, GDP is the gross domestic product, export is the value of export and import is the value of imports.

According to this equation (1), GDP is the function of export and import. GDP is also affected by consumption (C), Investment (I), government purchase (G) and export (X) and import (M) based on the expenditure approach. But here, it is needed to analysis mainly about the nexus between exports, imports and GDP. Therefor the above mentioned three factor such as consumption (C), investment (I) and government purchase (G) are eliminated in this model. Besides, some of empirical paper used another variables such as foreign direct investment (FDI) and trade openness which also support the powerful findings in the study of the relationship between foreign trade and economic growth. Also it is eliminated because the data are limit. Then, this function can be turn into a log-linear econometric format that:

$$\log(gdp) = \beta_0 + \beta_1 \log(export) + \beta_2 \log(import) + \mu - - - (2)$$

Where, β_0 = the constant term (intercept parameter)

β_1 = the coefficient of exports (slope parameter)

β_2 = the coefficient of imports (slope parameter)
μ = the error term

In the empirical literature for time series analysis, according to the data stationary which level data are being stationary, It have to choose the fitted model to analysis about the concept of our study. If the variables are all integrated into first different and become stationary, author will test the cointegration between the variables by using Johansen cointegration test for more than one endogenous in this study. Before doing this step, it must choose the lag selection. It is importance to specify proper lag length in estimating cointegrated system. If the cointegration relations are presented between the variables studied, Vector Error Correction Model (VECM) will be applied and the estimation will be based on the VECM result. If there are no cointegration among the variables, the Unrestricted Vector Autoregressive Model (Unrestricted VAR) will be applied.

3.2.1 ADF Unit Root Test

Testing for a unit root has become mostly common in time series econometrics. Cause, it allows to know the data will be stationary or non-stationary and the results from unit root testing make to be able to choice of the fitted model from the chosen time series data. To examine this test, author used the test such as the Augmented Dickey-Fuller test for the unit root. ADF test is the extension of Dickey-Fuller (DF) test which early and pioneering work on testing for a unit root in time series was done by Dickey and Fuller (1976, 1979). The following are the hypotheses in unit root test (Pesaran, 2015).

Null hypothesis : There is unit root and time series is non-stationary.

Alternative hypothesis : There is no unit root and time series is stationary.

3.2.2 Johansen Cointegration Test

A necessary step in empirically meaningful relationship among the variables is to find the cointegration within the variables. If variables do not have cointegration, they would not stay in fixed long term relations to each other. A non-stationary time series in which the number of co-integration vectors are determined by Johansen (1991) process base on Vector Autoregressive (VAR) with restrictions imposed. Johansen (1991.1995) defined the two different test statistics for co-integration in his approach base on maximum likelihood method which are the Trace Test and Maximum Eigenvalue Test (Pesaran, 2015).

Null hypothesis : There is no cointegration among variables.
Alternative hypothesis: There is cointegration among variables.

3.2.4 Vector Error Correction Model

VECM is the appropriate model of the strategy where the variables are integrated in first difference level but have to exit cointegration. The variables are cointegrated then the error correction term has to be included in the VAR model. The model becomes a vector error correction model which can be seen as a restricted VAR. This type of representation separates the long-term convergence from short-run adjustment dynamics. Because the long run equilibrium deviation is gradually corrected through short-run adjustments. The long-run relationship between variables can be analyzed through looking at the co-integration equations. Moreover, short-run relationship can be observed based on changes of the values in VECM estimation which gives long-run structural relations plus information on adjustment

(Bình, 2013). The following VECM equation is expressed with the logarithms of GDP, Export and Import.

$$\Delta \log (gdp)_t = \beta_0 + \sum_{j=1}^{k-1} \beta_j \, \Delta \log(gdp)_{t-j} + \sum_{i=1}^{k-1} \gamma_i \, \Delta \log(export)_{t-i} + \sum_{n=1}^{k-1} \delta_n \, \Delta \log(import)_{t-n} + \alpha(ECT)_{t-1} + \mu_t \quad (3)$$

Where, β_0= the constant term

$\beta_j, \gamma_i, \delta_n$ = the short run dynamic coefficients

α = the speed of adjustment parameter

$k-1$ = the optimal lag length reduced by lag one

$(ECT)_{t-1}$ = the lag value of error correction term which is residuals obtained from the long run co-integrating relationship.

4. Empirical Results

4.1) Test for Unit Root

Table (1) shows the result of unit root with ADF test in the level and the first difference. In line with ADF test, the optimal lag length is done by selecting the lag with the Schwartz Bayesian Information Criterion (SBIC). All the variables in the level appeared to be non-stationary where all the t-statistic value is less than the critical value at 1% significant level. Besides, p-value is also higher than the 5% significant level (0.05). So, all the variables are still under the conditions of non-stationary series. But these all variables are integrated in order (1), namely

in the first difference and then become stationary series because the t-statistic value is greater than the critical value at 1% significant level in first different and also p-value is under 5% significant level (0.05). It is concluded that all variables in this study, export, import and GDP are stationary at the first difference.

Table (1) Results of Unit Root Test: ADF

Variables	Level		First different		
	t-statistic	Probability*	t-statistic	Probability*	Critical value (1%)
Log (GDP)	0.4154	0.8933	5.2490	0.0002	3.6998
Log (Export)	0.2727	0.9724	5.0834	0.0003	3.6998
Log (Import)	0.4166	0.9801	4.5887	0.0012	3.6998

*MacKinnon-Haug-Michelis (1999) p-values. Source: Calculation

The process of cointegration is continued where the time series are being stationary in first difference but the series was purely non-stationary at the level, I (0). In order to test the Johansen's process, an appropriate number of time lag is required. To do that, the VAR lag order selection criteria method was applied. As its result in table (2), it can be used lag one or lag five. Author used only five lag for the model suggested by Akaike‟s Information Criterion (AIC) because of using lag one cannot be kept to continue the analysis of the paper.

Table (2) Results of VAR Lag Order Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-105.633	NA	1.715	9.053	9.200	9.092
1	-42.790	104.7395*	0.0194*	4.566	5.1548*	4.7220*
2	-38.286	6.380	0.030	4.941	5.971	5.214
3	-28.915	10.933	0.032	4.910	6.382	5.300
4	-15.990	11.849	0.029	4.582	6.497	5.090
5	-4.389	7.734	0.036	4.3657*	6.722	4.991

Source: Calculation * indicates lag order selected by the criterion

4.2) Test for Cointegration

Then, it is performed the Johansen cointegration test for the variables, GDP, export and import with the four lag ($k - 1 = 4$) which is one lag less than VAR model. Because, the order of corresponding VECM is always one lag less than the VAR model.

Table (3) Results of Cointegration: Johansen Test

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigen value	Trace Statistic	Critical value (5%)	Probability**
*None **	*0.725545*	*42.62103*	*29.79707*	*00.0010*
At most 1	0.305021	11.58967	15.49471	0.1777
At most 2	0.112219	2.856718	3.841466	0.0910
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigen value	Max-Eigen Statistic	Critical value (5%)	Probability**
*None **	*0.725545*	*31.03136*	*21.13162*	*0.0015*
At most 1	0.305021	8.732591	14.26460	0.3091
At most 2	0.112219	2.856718	3.841466	0.0910

Trace test and Max-eigenvalue test indicate 1 cointegrating eqn(s) at the 0.05 level * denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values
Source: Calculation

From the above table, trace test and max-eigenvalue test are statistically significant to reject the null hypothesis at 5% significant level. The reason is that the value of trace statistic and max-eigenvalue statistic are greater than 5% critical value and their p-values is also under 5% significant level at the number of CE(s) in none. Therefore, there is only one long run cointegration relationship between GDP and it determinants.

4.3) VECM estimation

After determining the variables have cointegration, the VECM is able to rum for model estimation.

Table (4) Long run result of VECM

Normalized cointegrating coefficients			
log(GDP)	log(export)	log(import)	Constant
1	-3.899936	2.632571	-1.295864
	(0.05792)	(0.09769)	
	[-67.3311]	[26.9470]	

Note: Standard errors in ( ) & t-statistics in [ ]
Source: Calculation

It can be analyzed the long rum equilibrium from the above table (4). Accordingly, the equation can be express as:

$$\log(gdp) = 1.29 + 3.89\log(export) - 2.63\log(import)$$

$$(0.05) \qquad (0.09)$$
$$[67.33] \qquad [26.94]$$

$$+\mu - - - - - - - - - - - - (4)$$

Note: Standard errors in ( ) & t-statistics in [ ]

It can be seen that the dependent variable, GDP and the independent variables, export and import are significantly

correlated. This equation represents that if 1% increase in export would lead to 3.89% increase in GDP and, if 1% increase in import is associate with 2.63% decrease in GDP in the long run. Therefore, GDP elasticity with respect to export is more than the GDP elasticity with respect to import.

Table (5) Short run result of VECM

Dependent Var: / Independent Var:	D(log(GDP))
Constant	0.303558 (0.32639) [0.93005]
D(log(GDP)(-1))	-0.192726 (0.3505) [-0.54986]
D(log(export)(-1))	0.738019 (1.1345) [0.65052]
D(log(import)(-1))	-0.722564 (1.03145) [-0.70053]
CE	-0.037288 (0.22121) [-0.16857]

Note: Standard errors in ( ) & t-statistics in [ ]
Results are summarized by taking only the case of GDP as dependent variable from original results.
Source: Calculation

Table (4) presents the short run result computed VECM estimation with the error correction. According to this table, short run equation can be formulated as:

$$\Delta \log(gdp)_t = 0.3 - 0.19\Delta \log(gdp)_{t-1} - 0.74\Delta \log(export)_{t-1}$$

(0.32) (0.35) (1.13)
[0.55] [0.65]

$$-0.72\Delta\log(import)_{t-1} - 0.037(ECT)_{t-1} + \mu_t - - - (5)$$
(1.03) (0.22)
[0.7] [0.17]

Note: Standard errors in ( ) & t-statistics in [ ]

In line with equation (5), it can be concluded that the dependent variable, current GDP does not depend on its and export and import in the previous period. Because all the t-statistic value of these independent variables are not statistically significant. Therefore, GDP cannot be affected by export and import in the short run. The coefficient of error correction term is the negative sign of 0.03 which is the speed of adjustment return to equilibrium in long run from the disequilibrium caused of exogenous shock in short run. However, this error correction term in this model indicates statistically insignificant and displays the weak exogeniety. To summarize, the GDP level cannot adjust error.

Table (6) VECM Estimation for short rum effect between GDP and Export, Import

Wald Test:			
Test Statistic	Value	df	Probability
F-statistic	0.101055	(8, 10)	0.9983
Chi-square	0.808442	8	0.9992
Null Hypothesis: C(6)=C(7)=C(8)=C(9)=0 C(10)=C(11)=C(12)=C(13)=0			

Null Hypothesis: There is no short run causalities from export and import to GDP.
Source: Calculation

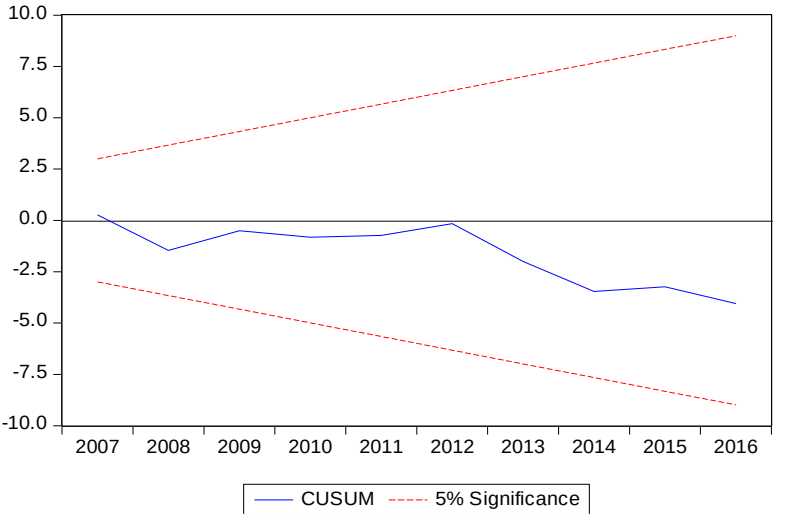
In the short run VECM results, according to the Wald test, there is no evidence for the short run causalities from export to GDP and import to GDP. Because p-value for the Chi-square is statistically more than 5% significant level.

Table (7) Residuals Diagnostic test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.35771	Prob. F(4,6)	0.8305
Obs*R-squared	4.62137	Prob. Chi-Square(4)	0.3284

Source: Calculation

Figure (3) CUSUM test



Residuals diagnostic test is focused with Breusch-Godfrey Serial Correlation LM test, table (7). This test shows that the null hypothesis of no serial autocorrelation in residuals

cannot be rejected. Therefore, there is no autocorrelation and serial correlation in residuals of VECM results. To confirm the stability of this estimated model is the CUSUM test. It shows that a blue trend line locates within the red boundary in figure (3). Accordingly, it can be conclude that the estimate VECM is dynamically stable.

5. Conclusion and Suggestions

This study examines the nexus between foreign trade and economic growth in Myanmar over 1988 - 2016. The finding is; there exit a long run relationship among export, import and GDP. According to the VECM estimated equation, export has positive affect to GDP that 1% increase in export would lead to 3.89% increase in GDP while the import has negative effect on GDP that 1% increase in import is associate with 2.63% decrease in GDP in the long run. But both export and import do not have significant relationship with GDP in the short run.

Thus, the study suggests that export expansion promotes the economic growth which also pointed out by Dr. Hla Myint, Burmese classical economist who postulated that the outward looking policy or export-promotion strategy are suitable for the developing countries. Therefore, export promotion policy should be implemented in the country because the export expansion positively associates with GDP. Besides, import have negative impact on GDP in the long run that the country should promote production to insurance domestic needs.

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