THE NEXUS BETWEEN ECONOMIC GROWTH AND GOVERNMENT EXPENDITURE IN MYANMAR

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Abstract

This paper attempts to study the nexus between economic growth and government expenditure of Myanmar. The data is applied from World Bank's database and it is annual data from 2000 to 2016. The Engle and Granger two steps method is employed to test cointegration and Error Correction Model. To trace the causality between two variables, Granger causality test is employed to investigate. The empirical findings present that both variables are cointegrated in long-run. Furthermore, in the result of Granger causality, there has unidirectional causality. This means that government expenditure does cause economic growth. In the interpretation, when government expends more money, the economy leads to growth in long-run.

Keyword: Government Expenditure, Economic growth, Unit root, Cointegration, Error Correction Model and Causality

1. Introduction

In this study, the period under question is determined as year 2000 to 2016. In the period it can be seen that three government administration eras are involved such as the military regime, Union Solidarity and Development Party (USDP) government and National League for Democracy (NLD) government. More precisely, the military regime can be determined as existing before 2010 general election, and the period 2010-2015 can be described as former president U Thein Sein administration (USDP government). Finally, NLD became an elected government in 2015.

Before 2015, military government spent huge budget upon military sector, higher than the budget spending on health and education (MDRI-CESD and IGC, June 2015). The budget deficit had been happening overtime and the government financed those budget deficits with money printed by the central bank. As scenarios, high inflation happened. On the other hand, the existing official exchange rate discouraged Myanmar's economic growth. In that military government, tax regime did not work well and taxation was not the main source of revenue for Myanmar. The government mainly relied for revenue on the country's natural resources. The impacts of the military government's mismanagement or complicated administration is still in effect even to this present day.

Notwithstanding, the government reformed the legal frameworks relevant to economic sectors and initiated enter is the international community in 2012. Foreign investment and entitled business activities flowed to the country. Various positive changes did happen in the USDP government era; nevertheless, uncompleted activities of USDP government remained for NLD government. NLD government continues to carry out those activities, though some policy priorities have been modified.

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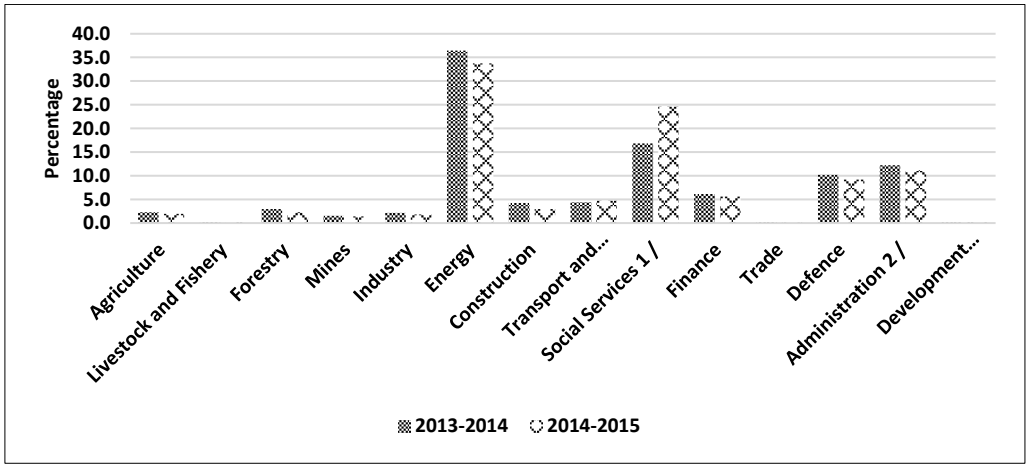
According to Myanmar government's expenditure policy (Citizen's Budget (2017-2018), May 2017), the top point is to increase and expend more money on education, health care and social security and as a second priority to spend on sectors which immediately return benefits from the expenditure. The following figure (1), distribution of expenditure of Union government by sector shows more has been spent on the energy and social services sectors than other sectors in both fiscal years. Expenditure on defence and government administration sectors followed as a second vast volume. The resulting expenditure on social services in Fiscal Year 2014-2015 was more than Fiscal Year 2013-2014.

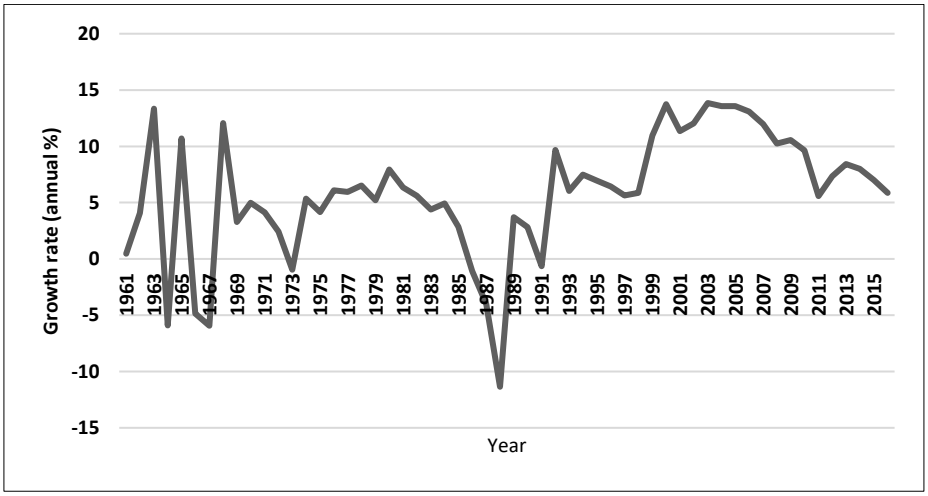
Figure (1): Expenditure of Union Government by sector (FY 2013-14 and FY 2014-15)



Source: (CSO, 2016), *Note: described data on current account is from Public Finance, Banking and Financial Market section*

Following figure (2) presents a graphical presentation using Myanmar's historical data from World Bank database. Annual growth rate in time series data express the fluctuation of economic growth in Myanmar over time. The trend of growth on extreme ups and downs and led long run to decline. (Myint, December 2009)

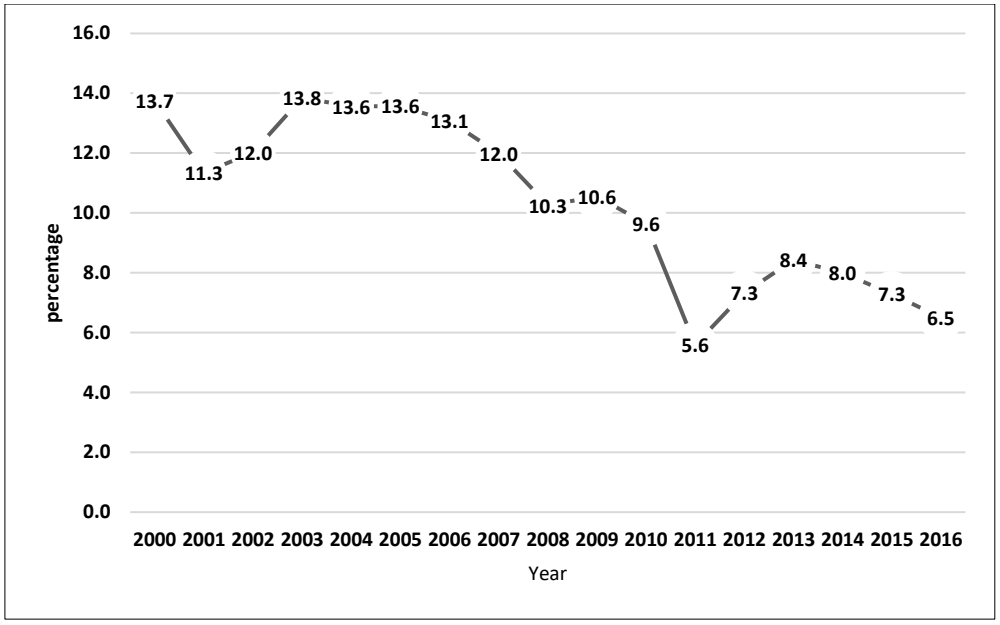
Figure (2): Economic growth rate from year 1961-2015



Source: (The World Bank, 2017), *Note: described data is from country data of Myanmar in the World Bank database*

Following figure (3) shows the economic growth of Myanmar from year 2000 to year 2016. It with annual growth rates of Myanmar in general decline. The growth rates in year 2010 and 2011 dropped sharply from 9.6 % to 5.6 %. It can be said that a critical change in economic growth may be effected by political reform and other factors.

Figure (3): Economic growth rate from year 2000-2016



Source: (The World Bank, 2017), described data shows the country data of Myanmar from the World Bank database.

Similar empirical findings, the nexus between government expenditure and economic growth of Myanmar, has not been found before. Therefore, this study attempts to support an empirical finding to policy makers. The limitation in this study is that the number of observations (annual data) are insufficient to time series analysis.

1.1 Objective of the study

The purpose of the study is to investigate the nexus between the government expenditure and economic growth. Moreover, the investigation forwards the idea that government expenditure could have positive or negative effects on the economic growth over time. The author tries to support a productive recommendation in consideration of the policy matters in the long term.

2. Literature Review

This section is about the previous findings which are related to this empirical analysis from other researcher's findings and other countries. There are similar studies in other countries on the relationship between economic growth and government expenditure, and, applied similar methodologies and variables. Nevertheless, different associations were found. (SRINIVASAN, 2013), the research found that the cointegration test result confirms the existence of long-run relationship between public expenditure and economic growth in India. The study applied the cointegration approach and error correction model to investigate the relationship and causality among the variables which are public expenditure and economic growth. Time series was

applied from 1973 to 2012. Moreover, the results of error correction model said that unidirectional causality could be found in this testing, meaning one-way direction from economic growth to public expenditure in the short-run and long-run; the author said that the result supports Wagner's law of public expenditure. In his research, public expenditure of the India government exceeded the revenue of the government in the practical condition.

A cross-country study by (Landau, 1983) investigated and presented the results that a negative relationship existing between the share of government consumption expenditure in GDP and the rate of growth of par capita GDP could be found, generally, because of the existence of various and many countries in this panel study is not favorable to reach one decision or one finding for all selected countries. Therefore, the negative relationship was found for the full sample of counties, unweighted or weighted by population. In that study, over 100 countries were studied.

This paper (Sinha, December 1998) attempts to test the long run relationship and between GDP and government expenditure in Malaysia using time series data from 1950 to 1992. To find the cointegration, the author applied the Johansen cointegration and optimal lag selection sensitive in the test. The Akaike Information Criterion (AIC) and Schwarz Bayesian Criterion (BIC) were used to find the optimal lag selection. The study found that the variables have a long run positive relationship. Granger causality was applied and the result indicated that the changing in GDP does not cause changing in government expenditure. A finding of long-run relationship between GDP and government expenditure which supports the theory in Wagner's law, state causality between those variables said that the different stories.

The study "Government Expenditure and Economic Growth in Nigeria" by (Abu Nurudeen, Abdullahi Usman, 2010), reveals a result that the government total capital expenditure, total recurrent expenditure and expenditure on education have negative effect on economic growth. But rising government expenditure on transport and communication and health sector lead to increase economic growth. In this study, the author applied disaggregated analysis, using time series data from 1970 to 2008. Furthermore, cointegration and error correction methods were used to analyze the between government expenditure and economic growth. A finding in this study, for instance, is the relationship 1 percentage increase in total capital expenditure in the previous two years causes economic growth to decline by 0.004 percentage. Similarly, 1 percentage increase in total recurrent expenditure in the previous one year leads to 0.005 percentage decrease in economic growth. Lastly, the resulting error correction showed that long-run relationship or long run equilibrium exists between the variables.

The study by (Ejaz Ghani and Musleh-ud Din, Spring 2006) concluded the investigation was conducted to trace the relationship between the public investment and economic growth of Pakistan. To trace this impact of public investment on economic growth, the vector autoregressive (VAR) approach was applied. Time series data from 1973 to 2004 were used in this investigation. In the methodologies used, VAR and error correction modelling were applied. Moreover, Johansen cointegration test were applied to determine where or not the variables have long-run equilibrium relationship. For the VAR, optimal lag length selection

criteria were determined by using with Akaike Information Criterion (AIC), and Schwarz Criterion (SC). The empirical results showed that economic growth of Pakistan is largely driven by public investment.

According to the (Jiranyakul, 2007), the relationship between government expenditure and economic growth in Thailand. The author applied the Granger causality test to find the causality among the variables. Furthermore, cointegration test and ordinary least square were applied in that study. The empirical finding reveals there was no cointegration among both variables and unidirectional causality existed from government expenditure to economic growth. In other word, when government expenditure increases, economic growth can be effected.

According to (Magazzino, May 2012), studied variables are cointegrated in long run. Time series are employed for the period 1960-2008 of Italy's county data. In this study, cointegration test and Granger causality test are employed. Not only empirical analysis but theoretical analysis also are applied.

3. Theory and Methodology

Government expenditure plays a vital role in the economic growth of a country. Increasing government expenditure or government purchases can contribute to aggregate economic growth, more precisely, job opportunities can be created. In other words, unemployment rate will decline, then, higher earning or income of household will occur because of the multiplier effect (Mankiw, 2009). Furthermore, government expenditure effects also distribution of income among the citizens (Hyman, 2011). Richard Musgrave (1959) described essentially three roles for government: allocation, stabilization, and distribution. The first role, allocation of society's resources, occurs when market failure exists and the private market is not efficient. Government steps in to correct the market inefficiency. An example would be the provision of national defense. Stabilization is the second role of government, according to Musgrave. Stabilization pertains to macroeconomic concerns about policy areas such as inflation, the monetary system, interest rates, and the overall employment rate. The third and final role of government according to Musgrave is distribution. This is primarily concerned with the division of income and other resources such as in-kind aid among citizens (Musgrave, 1959). It typically involves redistributing resources from the wealthy to the poor. Examples of redistribution at the national level are the Social Security and Medicare programs, which provide a safety net for elderly and poor people who, prior to the programs, were over represented among the poor (Leland, 2005).

On the other hand, different theories exist regarding government spending. Three different theories can be demonstrated briefly. They are (1) the public choice theory of bureaucracy, (2) the displacement effect hypothesis and (3) Wagner's law. The theory of bureaucracy proposed by (Niskanen, 2007) emphasizes the role of self-interest of the bureaucrats. The bureaucrats are interested in maximizing the bureau's budget. Therefore, this theory relates to the activities of politicians for their budgets. The second approach is the displacement effect hypothesis that was propounded by Peacock and Jack Wiseman (Peacock and Jack Wiseman, 1961). They argue that under normal conditions of peace and economic stability, changes in public expenditure are rather limited (Sinha, December 1998). Wagner's Law is one of the first surely

most known model for the determinants of public spending (Magazzino, May 2012). According to Wagner's Law, during the process of economic development, the share of public spending in national income contribute to expend. The reasons are public function substitute private activities and when the development results in an expansion of spending on culture and welfare, public intervention might be necessary to manage natural monopolies (Magazzino, May 2012).

The study considers employ meant of the time series analysis for both variables. In the quantitative analysis, existing relevant policy, laws, respective institution and the role of key players are explored. It is assumed that the above factors can cause economic growth. Become to be known the causation upon the economic growth, quantitative and qualitative study should be used. Sole empirical analysis is imperfect for this study.

In this study, the following variables are defined as a notations;

g= economic growth

e= government expenditure

Here unit root test, cointegration (Engle & Granger two steps approach) and causality are attempted. Step by step process can be displayed as following;

Step (1): Unit root test

This test is aimed to investigate the stochastic trend in a time series, sometime called a "Random walk with drift". The three possible forms of the Augmented Dickey-Fuller (ADF) test are given by the following equations:

$$\Delta Y_t = \delta Y_{t-1} + \sum_{i=1}^{p} \beta_i \Delta Y_{t-1} + e_t \quad (1)$$

$$\Delta Y_t = \alpha + \delta Y_{t-1} + \sum_{i=1}^{p} \beta_i \Delta Y_{t-1} + e_t \quad (2)$$

$$\Delta Y_t = \alpha + \gamma T + \delta Y_{t-1} + \sum_{i=1}^{p} \beta_i \Delta Y_{t-1} + e_t \quad (3)$$

The above equations are applied to estimate the series whether stationary or nonstationary (Bình, 2013). (Brooks, 2008), unit root test would be to examine the autocorrelation function of the series of interest. Various literature reviews expressed that before an analysis of time series regression is begun, the series much be defined clearly whether or not it is stationary. The process is required to be moving forward.

Step (2) Cointegration

The present author considers investigation of the cointegration between economic growth and government expenditure in the long run and short run in Myanmar. This experiment

is to trace the relationship and to produce appropriate policy suggestion. Therefore, the relationships between these variables should be tested. Common equation for cointegration can be described as following;

$$Y_t = \propto + \beta X_t + U_t, - (4)$$

The above equation states the long run equilibrium between two variables and obtains the residuals for this equation (Bình, 2013) . Studied variables are substituted into above equation;

$$g = \beta_1 + \beta_2(e) + \beta_3 T, - (5)$$

Where ***g*** is economic growth and ***e*** is government expenditure. It is known as a cointegrating regression and the slope parameters β_2 and β_3 are known as cointegrating parameters (Bình, 2013).

In this step, cointegration test is applied to investigate the long-run and short-run association between studied variables. For this test, an estimation which is ordinary least square (OLS) is applied. According to (Bình, 2013), ECM model are stationary and the standard OLS estimation is therefore valid.

Step (3) Error Correction Model (ECM)

An ECM allows us to study the short-run dynamics in the relationship between studied variables. In addition, following, ECM model can be described.

$$\Delta y_t = \alpha_0 + \gamma_0 \Delta x_t + \delta(y_{t-1} - \beta x_{t-1}) + u_t, - - - - - - - - - - - - - - - - (6)$$

Where $\delta < 0$. If $y_{t-1} > \beta x_{t-1}$, then y in this previous period has overshot the equilibrium; because $\delta < 0$, the error correction term works to push y back toward the equilibrium. Similarly, if $y_{t-1} < \beta x_{t-1}$, the error correction term induces a positive change in y back toward the equilibrium (Wooldridge, 2009). For example, changes in y_t relate changes in x_t according β_1 (Bình, 2013).

Step (4) Causality

The Granger Causality Test (Gujarati, 2004), the causality test refers to the ability of one variable to predict the other. In this study, *e* (government expenditure) is predicted as having causality to economic growth (*g*) and vice versa, *g* is predicted that it effects causality to *e*.

$$Y_t = \sum_{i=1}^{n} \alpha_j Y_{t-i} + \sum_{j=1}^{p} \beta_j X_{t-j} + U_{1t} - (7)$$

$$X_t = \sum_{j=1}^{p} \lambda_j Y_{t-i} + \sum_{j=1}^{p} \delta_j X_{t-j} + U_{2t} - (8)$$

Studied variables are substituted into the equations of the Granger causality;

$$e_t = \sum_{i=1}^{n} \alpha_j \, e_{t-i} + \sum_{j=1}^{p} \beta_j \, g_{t-j} + U_{1t} \quad ---------- (9)$$

$$g_t = \sum_{j=1}^{p} \lambda_j \, e_{t-i} + \sum_{j=1}^{p} \delta_j \, g_{t-j} + U_{2t} \quad ---------- (10)$$

Where, *e* is public expenditure and g is economic growth. Equation (9) postulates that the *e* is related to past value of itself as well as that of *g*, and then equation (10) a similar behavior for *g*. For the estimation, four cases can be found that 1) unidirectional causality from *e* to *g*, 2) unidirectional causality from *g* to *e*, 3) bilateral causality and 4) independence. An explanation for first case, if the estimated coefficients on the lagged *e* in equation (1) are statistically different from zero as group (i.e.,$\sum \alpha_i \neq 0$) and the set of estimated coefficient on the lagged G in equation (2) is not statistically different from zero (i.e.,$\sum \delta_i = 0$). Then explanation for second case, the set of lagged *e* coefficient in equation (1) is not statistically different from zero (i.e.,$\sum \propto_i = 0$) and the set of the lagged *g* coefficients in equation (2) is statistically different from zero (i.e.,$\sum \delta_i \neq 0$). For third case, bilateral causality can be indicated when the sets of *e* and *g* coefficient are statistically significantly different from zero in both regressions. In the final case, independence is determined when the sets of *e* and *g* coefficients are not statistically significant in both the regressions (Gujarati, 2004). One guideline to test the Granger causality, the variables are needed to stationary test and are proven to be integrated of either I(1) or I(2), because economic variables are non-stationary traditionally (Awe).

Hypothesis for Granger Causality Test, unidirectional causality from *e* to *g*,

Null Hypothesis, H_0: e does Granger-cause g

Alternative Hypothesis, H_1: e does not Granger-cause g

Hypothesis for Granger Causality Test, unidirectional causality from *g* to *e*,

Null Hypothesis, H_0: g does Granger-cause e

Alternative Hypothesis, H_1: g does not Granger-cause e

4. Empirical Results

(1) The result of unit root test

The first step in this study, both variables are tested for being stationary or non-stationary. A nature of macroeconomic variables are traditionally non-stationary at level. It also occurs in this study, especially, that both variables are non-stationary at the Level (level zero), but they integrated at I (1) with 95 % confidence.

Table (1) the results of Augmented Dickey-Fuller test for unit roots

Level of Significance.	Variables	Constant	Constant & trend	Without constant & trend
1: Level	g_t	-0.944109	-2.216676	-1.423990
	e_t	-0.325445	-2.325500	-2.735973
2: 1st difference	Δg_t	-4.126476*	-4.083772*	-4.075586*
	Δe_t	-3.990520*	-4.022952*	-2.333002*

*—Confidence level at 95 %, and t-value are presented above. g and e are Growth rate and Public Expenditure respectively. *---- represent significantly at 5 percent level, respectively. Optimal lag length is determined by the Schwarz Information Criterion (SIC).*

Table (1) shows that the results of the unit root performed by Augmented Dickey-Fuller testing. Both variables, Economic Growth (Δg_t) and Government Expenditure (Δe_t) are integrated at first different level, I (1). Furthermore, both variables can be concluded as being stationary at first different level.

(2) The result of cointegration (Engle-Granger 2-Step Method)

For next step in this study, cointegration test is performed to investigate a cointegration between those two variables. In order to investigate the cointegration test, Engle & Granger 2 step method is appropriate. The reason is the characteristic of the data which are stationary at I (1) level, in other word, both variables are cointegrated or no longer spurious. In the step of cointegration test, the residual value is needed to investigate that it will be stationary or nonstationary. The purpose of the test is an attempt to explain the long run relationship between variables.

As a decision guideline, if the residual value is statistically significant at a level of 1%, 5% and 10%, it can be defined a stationary. It means that if the residual value is stationary, both variables move together and we can say that they have long-run relationship.

Decision guideline is H_0 can be rejected when t-statistic is greater than critical values[1]. The results in the table show that t-statistic is greater than critical values which are 5 percent and 10 percent. In addition, *p* value (probability value) is also significant at 5 percent level. Therefore, null hypothesis can rejected and it means that residual does not have a unit root, in other words, residual (error term) is stationary. In the interpretation, both variables become contegrated; furthermore, they move together and have long-run relationship.

Null Hypothesis, H_0: residual has a unit root.

Alternative Hypothesis, H_1: residual does not has a unit root

After the residuals is investigated, the result indicates that the residual does not has unit root, in other words, the residual exists nonstationary. Moreover, the R-square becomes less than Durbin-Watson Statistic. Hence, the null hypothesis can be rejected, when the value of T

[1] *p value, it depends on the author's selection whether 1% or 5% or 10%.*

statistic is greater than critical values which are 5 percent and 10 percent. Therefore, the model becomes a non-spurious model, both variables are cointe*g*rated in lon*g* run relationship. The followin*g* table shows the detailed results;

Table (2) the result of unit root test for Residual (Error Correction Term)

Variables	t-statistic	Critical value	*p* value
Residual	3.475185	3.119910*	0.0273
		2.701103**	

** refer to 5 percent level and ** refer to 10 percent level. R^2 = 0.609312 and Durbin-Watson stat = 2.042683, R^2 < Durbin-Watson stat.*

(3) Error Correction Model

Hence, error correction model allows the test when the variables are cointe*g*rated. The purpose of the test is to analyze the lon*g* run and short run effects of the variables as well as to see the adjustment coefficient (Bình, 2013). The result shows that *e* which is stationary at first difference represents for the short run relationship and its *p* value is insi*g*nificant to explain the relationship between two variables in short run. Therefore, the variables which of economic growth and government expenditure have no association in short run. It is meaning that when the government increases or decreases public expenditure, economic *g*rowth cannot be effected in short run. Moreover, the value of error correction term has negative sign while the *p* value is greater than 5 percent. It can be said that Error Correction Model (ECM) is insignificant. Nevertheless, the model can be said to be a nonspurious model, because the R^2 is greater than Durbin-Watson Statistic.

Table (3) the result of Error Correction Model

Variables	Coefficient	t-statistic	*p* value
C	-0.035645	-0.056934	0.9556
D(e)	-4.808513	-0.761772	0.4622
ECT(-1)	-0.007232	-0.024942	0.9805

Note: R^2 is 0.050 and Drubin-Watson stat is 1.954, R^2< Drubin-Watson stat. p value of ECT is insignificant.

(4) Granger Causality

Nevertheless, Gran*g*er Causality test is employed to give a robust evidence of causality between economic growth and government expenditure. Granger Causality test becomes to investi*g*ate the bidirectional or unidirectional association amon*g* two variables. Accordin*g* to followin*g* table (4), each result of the causality show with various lag selections. According to (Gujarati, 2004), the lower the values of Akaike Information Criterion (AIC) can be determined that the model is better. Therefore, lag decision guideline suggests that the lower value of AIC should be chosen. That is why, accordin*g* to this decision *g*uideline, lag 4 is appropriate to be chosen as an optimal lag selection. Therefore, the finding shows that log *e* does not cause *g*, and also *g* does not cause log *e*. The selected lags do not have evidence significantly to explain

the causality between economic growth and government expenditure. In addition, hypothesis statements can be exhibited as following;

Null Hypothesis: e does not cause g

Alternative Hypothesis: e does cause g

Decision rule is that null hypothesis can be rejected if *p* value is less than 0.05[2].

Table (4) the results of Granger Causality test

Null Hypothesis	*p* value	Lags	Decision	Outcome
H_0: log *e* does not cause *g*	0.0119 (<5%=0.05)	2	Reject Null	log *e* cause *g*
H_0: *g* does not cause log *e*	0.7585 (>5%=0.05)	2	Do not reject Null	*g* does not cause log *e*
H_0: log *e* does not cause *g*	0.0412 (<5%=0.05)	3	Reject Null	log *e* cause *g*
H_0: *g* does not cause log *e*	0.2422 (>5%=0.05)	3	Do not reject Null	*g* does not cause log *e*
H_0: log *e* does not cause *g*	0.2481 (>5%=0.05)	4	Do not reject Null	log *e* does not cause *g*
H_0: *g* does not cause log *e*	0.0940 (>5%=0.05)	4	Do not reject Null	*g* does not cause log *e*

Note: p value is determined 5% (0.05).

Following table shows the optimal lag selection for Granger causality among the economic growth and government expenditure. Following displayed results are generated from optimal lags selection applied via unrestricted Vector Autoregression estimation. It is aimed to identify an optimal lag selection. In the following table, total system value and individual value of AIC are compared and shown. Various literature reviews suggest that lower total system value of AIC is a best model to explain the causality.

Table (5) the optimal lag selection

	Individual AIC value				Total System Value			
	Lag (1)	Lag (2)	Lag (3)	Lag (4)	Lag (1)	Lag (2)	Lag (3)	Lag (4)
g	3.322189	3.257752	3.217437	3.498212	1.433675	0.970754	0.594189	0.037662
log *e*	-1.853960	-2.233931	-2.470654	-3.436730				

[2] *In this study, author determine that p value is 5 percent level.*

5. Discussion and Conclusion

According to empirical results, economic growth and government expenditure are cointegrated in long-run equilibrium. In the interpretation, economic growth will increase when expenditure is increased. In contrast, economic growth will decline when government spends less. One limitation is that this study cannot cover specific sector of spending by the government; it means that the finding cannot say which sector is determinant for the economic growth of Myanmar. Therefore, this study can contribute the result that there is long-run cointegration between the two variables. Furthermore, according to Granger causality, government expenditure does cause economic growth unidirectionally in the previous two to three years (lag 2 to lag 3). But, in previous four year (lag 4), causality does not exist. The results can be interpreted that increasing government expenditure contributes positively to economic growth. Therefore, theoretically, increasing of government spending (even if budget deficit is happened) can support increasing of economic growth in long-run.

5.1 Suggestions for future research

For future research, the following investigations should be addressed: the empirical investigation of the determinants of economic growth using government expenditure by sectors. Short-run and long-run relationships should be tested. Eventually, a model should be invented for policy implication in government expenditure and economic growth of Myanmar.

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