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An Analysis of Fiscal Policy and Wagner's Law in the Context of Nepal

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Abstract

There is a lot of discussion among economists about the relationship between expenditure of the government and gross domestic product (GDP). The paper seeks to examine the association between GDP and government expenditure by utilizing the concept of Wagner's Law. Both long run and short run relationships are examined by use of popular econometric techniques. From the result of Engle-Granger test the significance of Wagner's law is found in the context of Nepal when taking governance and government capital expenditure as the independent variables of economic growth. It has been found that when GDP increases by one percent, capital spending rises by 0.4 percent in the long run. However, the Granger causality test does not reveal any causal relationship between the variables of interest.

Keywords: Government expenditure, Real GDP growth, Governance, Co-integration

1. Introduction

Fiscal policy is an important instrument for addressing short-term changes in output and employment. Public expenditure, as a key component of fiscal policy, not only influences the sustainability of public finances through its impact on fiscal balances and government debt, but it can also pursue other goals such as increasing output, employment, and income redistribution, all of which contribute to overall economic well-being. The relationship between government spending and economic development is complex and multifaceted. While government spending can stimulate economic growth through investment in infrastructure, education, healthcare, and research and development, excessive spending without proper fiscal management can lead to inflation, debt accumulation, and crowding out of private investment. Moreover, the effectiveness of government spending in promoting economic development depends on various factors such as the quality of spending, institutional capacity, and the overall economic environment. When allocated efficiently and directed towards productive activities, government spending can enhance long-term productivity, innovation, and competitiveness, thereby fostering sustainable economic development. However, it's essential for governments to strike a balance between spending to stimulate growth and maintaining fiscal discipline to ensure macroeconomic stability in the long run.

Wagner's law is one of the most widely held hypotheses on the relationship between government spending and economic development.

Despite the pivotal role of government expenditure in Nepal's economic development, there has been limited research dedicated to the study of government expenditure in the Nepalese context. Despite a consistent allocation of government expenditure in Nepal since 1952, the country has experienced a prolonged period of sluggish economic growth. Notably, between 1974 and 2017, Nepal's nominal GDP increased by nearly 183 times, while government expenditure rose by approximately 329 times (MoF, 2017).

This significant difference between government spending growth and GDP expansion emphasizes the importance of investigating the relationship between public expenditure and real GDP in Nepal. Public spending is critical in fostering economic growth, particularly in sectors that prioritize social well-being, such as infrastructure, education, and healthcare.

The discussion on how public spending affects economic growth is an ongoing global debate, with some economists proposing a favorable impact, while others explore potential adverse effects.

Furthermore, in addressing macroeconomic challenges such as high unemployment, insufficient national savings, excessive budget deficits, and significant public debt burdens, fiscal policy has widely been recognized as the central focus of policy discussions in both developed and developing countries. This study tries to analyze the application of Wagner's law to Nepal from 1974 to 2017. A time-series analysis is used to determine whether Wagner's law is applicable in Nepal. The research methodology used in this study consists of several major steps: doing unit-root tests to assess stationarity, using the Johansen cointegration approach, developing an error-correction model, and performing Granger causality tests. The data provide solid evidence of a long-term relationship between GDP and government spending. Furthermore, the causal link was found to be bidirectional. As a result, this study offers credence to the validity of Wagner's law in the setting under consideration.

2. Literature Review

The different research mentioned above, both theoretical and empirical, have shed insight on the relationship between public spending and growth. But the results are not similar in different countries. The variation in the result shows that there are inherent limitations in both Keynesian and Wagnerian theory of public spending while applying across countries and within countries over a period of study. It reveals that government expenditure is growing due to a rise in the national income of the country. The various studies have contradictory results of public spending on growth. In some studies, government expenses cause the growth of the economy. But in some study no causality between government expenditure and growth.

Attari and Javed (2013) had established the association between government expenditure and economic growth in the context of Pakistan using time series data from 1980 to 2010. Similarly, Atesoglu (1998) and Malik and Chaudhury (2002) used real GDP as the explained variable and the corresponding explanatory variables are rate of inflation and real government expenditure. They further took the natural log of each variable under consideration. They decomposed the government expenditure into current expenditure and development expenditure. To evaluate co-integration, they used the autoregressive distributed lag (ARDL) approach to estimate coefficients in both the long and short runs. In addition, they performed the Granger Causality test to confirm the direction of causality between the variables under investigation. The findings revealed a one-way causal relationship between the rate of inflation and GDP, government spending and GDP, and government capital expenditure and GDP. They utilised the LM test to test for serial correlation and discovered that there is none. Finally, the model has passed the stability tests. CUSUM and CUSUMSQ tests were used to evaluate the model's stability. Because of these tests, they discovered that the model is stable. They reported that the coefficient of current spending is statistically low.

Shrestha (2009) used Nepal’s data from 1982 to 2007 to examine the association between government spending and economic growth. The study used a model based on Devaranjan et al. (1996) and Semmler et al. (2007) to investigate the link between public spending and economic growth. The data showed that public expenditure has a favourable impact on Nepal's economic growth. Furceri (2007) conducted a cross-country analysis to investigate the effects of government spending on economic growth. The purpose of this article is to investigate the relationship between public expenditure business cycle volatility and long-run growth.

In a similar line, Acharya (2016) examined the relationship between governmental expenditure and economic growth in Nepal from 1975 to 2015. The study used a variety of dependent variables, including trade openness, government revenue, government revenue-to-GDP ratio, government expenditure-to-GDP ratio, and average annual rainfall. To determine causality between these variables, the Granger Causality test was used. The findings demonstrated a favourable link between government spending and growth in Nepal during the study period.

Barro (1990) has developed theoretical mathematical form for public spending and growth, and he concluded basically that production- enhancing public expenditure fosters the endogenous growth and whereas utility-enhancing expenditure reduces the growth. It shows the causality of productive government expenditure runs to economic growth.

Olayungbo and Olayemi (2018) explored the relationship between non-oil revenue, government spending, and economic growth in Nigeria from 1981 to 2015. They followed Okoro (2009), dividing capital into non-oil revenue and government spending. They expanded Johansen ML to test impulse response and Granger causality. They used the error correction model (ECM) and impulse response shock to investigate short and long run dynamics. They found the presence of co-integration among the variables in the long run. The findings revealed that government expenditure has a negative impact on economic growth in both the long and short run, whereas non-oil revenue had a favourable impact on growth. For example, they discovered that a 1% increase in public spending reduces GDP by 3.26% over the research period, whereas a 1% increase in non-oil revenue results in a 0.35% increase in GDP. In contrast, non-oil revenue shocks have a negative influence on economic growth, but government spending shocks have a positive impact on growth during the research period. Unidirectional causality exists between government spending and economic growth, as well as between government spending and non-oil earnings. The results support the Keynesian hypothesis while rejecting Wagner's theory.

Ejaz et al. (2017) published a paper using Pakistan's time series data spanning 1982 to 2017. The growth rate is the explained variable, while the explanatory variables are development, health, defence, and education spending. The authors utilised the ordinary least squares test to verify the association, and the CUSUM square test to assess stability. They employed the ADF test to determine the stationary of variables. The research stated that public outlays have an important influence in Pakistan's overall economic growth. However, not all components of governmental expenditures had the same impact on economic growth in Pakistan.

From a critical examination of existing literature pertaining to public spending across various economies, it becomes apparent that both directly and indirectly, the discussions gravitate towards the complex dynamics of public expenditure. Within this discourse, despite the abundance of literature exploring Wagner's law and its implications, a noticeable gap exists in the examination of the interplay between government expenditure, economic growth, and fiscal policy. While numerous econometric models have been proposed to elucidate different facets of Wagner's law, there remains a dearth of studies addressing the multifaceted relationship between these variables.

3. Research Methodology

Research design: The paper utilized the econometrics and analytical research design to meet the objective of the paper. This paper utilized Peacock-Wiseman (1961) Version of Wagner's Law. It has two variables such as real government expenditure and real GDP. But capital expenditure is used in this paper instead of using overall public spending. The paper employed the following statistical techniques viz i) Stationarity test; ii) Co-integration test; iii) Causality test; iv) Diagnostic test (both coefficient diagnostics and residual diagnostics) and v) Stability test.

Sources of Data: Secondary data has been applied for this paper. The data of government finance has taken through 'Handbook of Government Finance Statistics 2017', published by NRB and Economic Survey published by Ministry of Finance of Nepal. And the data for GDP and population have extracted from the World Bank. Initially, both nominal and real GDP series in local currency have taken out. The nominal figure of government expenditure has taken out from NRB's publication 'Handbook of Government Finance the paper analyzed the significance of Wagner's Law in context of Nepalese economy from 1975 to 2019 and to examine the nexus among growth, government expenditure and fiscal policy.

Model Specification: The majority of the macroeconomic variables are non-stationary series. After conducting unit root test, the Engle-Granger Co-integration Test is used in the study to evaluate the Wagner's Law.

$$\boldsymbol{y_t = \alpha + \beta x_t + \varepsilon_t} \qquad (1)$$

Where,

y_t = Real Government Capital Expenditure and it indicates real government per capita expenditure too.

x_t = Real Gross Domestic Product, it indicates real government per capita expenditure too.

α = constant term,

β = Coefficient or estimating parameters,

ε_t = error term,

The Engel-Granger co-integration test involves two steps:

a. Using OLS, estimate equation 1 to obtain the residual series.
b. Test the residual series' stationarity.

In economic terms, two variables are cointegrated if they have a long-run (equilibrium) relationship. If there is a long-run equilibrium, the model's long-term dynamics must be measured. Co-integration indicates that the data are linked using an Error Correction Model (ECM). The principles of co-integration and error correction mechanism are extremely similar.

If government expenditure (y_t) and GDP (x_t) are integrated, the relationship between remittances (y_t) and inflation (x_t) in an ECM can be written as -

$$\Delta y_t = \alpha_0 + \beta_1 \Delta x_t + \pi \widehat{\mu_{t-1}} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

Equation (2) incorporates both long-run and short-run data. In this model, coefficient 'β_1' is the impact multiplier (short-run effect) that assesses the immediate impact of a change in inflation on remittances.

4. Analysis and Findings

Procedures of analyzing the relationship

The first step is the summarization of statistics of the variables. It is followed by the line graphs of the variables under study. Afterward, unit root tests are taken in order to assure the elimination of spurious regression. Then after that, different econometric techniques are treated as per the demand of unit root test. This procedure is followed by diagnostic and stability tests. Finally, the Granger causality test is used to detect a causal relationship between variables.

Table 1: Summary Statistics

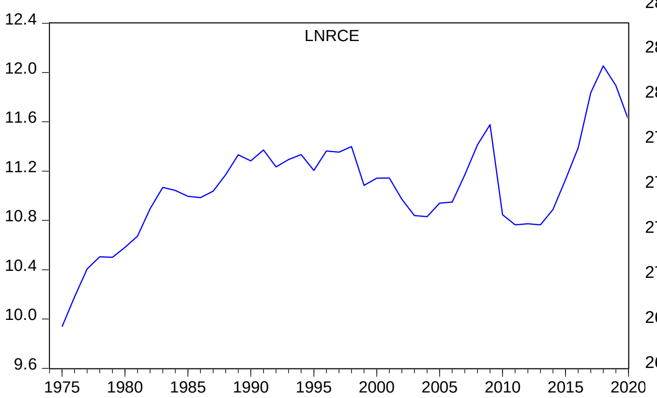
	LNRCE	LNRGDP	LN(RGDP/P)	LN(RGE/P)
Mean	11.06884	27.51005	10.65269	8.952065
Median	11.07640	27.54158	10.61986	8.909737
Maximum	12.05426	28.48106	11.32993	10.12570
Minimum	9.938166	26.59458	10.20407	7.811040
Std. Dev.	0.416325	0.576203	0.338131	0.523670
Skewness	-0.185076	0.003190	0.407166	0.355656
Kurtosis	3.598371	1.759913	2.057668	3.017831
Jarque-Bera	0.948864	2.947558	2.972993	0.970376
Probability	0.622238	0.229058	0.226164	0.615581
Sum	509.1668	1265.462	490.0237	411.7950
Sum Sq. Dev.	7.799683	14.94044	5.144965	12.34036
Observations	46	46	46	46

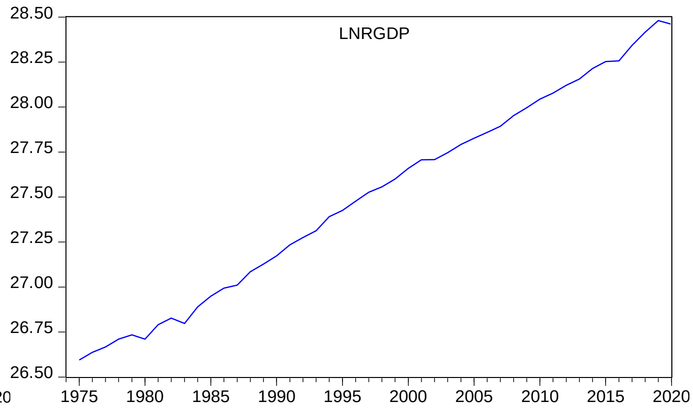
Source: Author's estimation

Note: RCE= Real Government Capital Expenditure, RGDP= Real Gross Domestic Product, RGDP/P= Per capita Real GDP, RGE/P= Per capita Real Government Expenditure

The Line Graph of the Variables

The line sketch of the variables shows the trends. By observing the graph, nature of data can be known. The line graph of the variable under study is presented below.





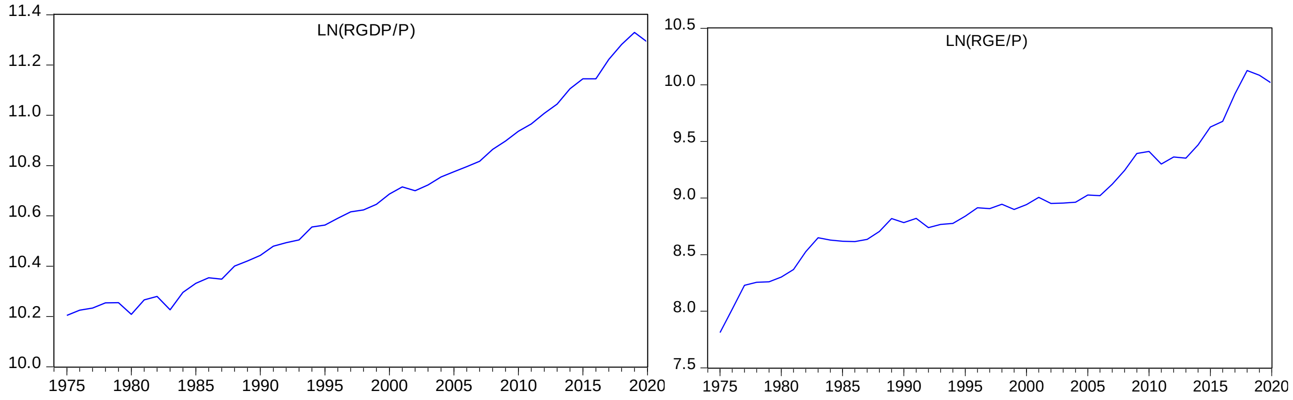


Figure 1: Line Graphs of the Variables

Source: Author's estimation

From the study of line graph, it is summarized that all the data are trended and also upward slope against time reference. We can infer that the data do not have mean zero and constant variance. It means the data are not stationary at level. It may be stationary at first difference or second difference. But the final decision of whether the variables are stationary or not would be checked by unit root test.

Unit Root Test

The unit root test is the most effective approach to check for stationarity. The Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests are used in this investigation. In both test statistics, the null hypothesis indicates the presence of a unit root. If the p-value is less than 0.05, we can reject the possibility of a unit root and conclude that the variable is stationary. Because we saw both the trend and the intercept in the graphical picturing, the test is performed in intercept and trend mode. The test results are presented in the following tables.

Table 2: Augmented Dickey-Fuller (ADF) Test Results

Null Hypothesis: the variable has a unit root					
	At Level				
		LNRGEP	**LNRGDPP**	**LNRGDP**	**LNRCE**
With Constant	t-Statistic	-0.8646	1.5195	0.1808	-2.7928
	Prob.	***0.7903***	***0.9991***	***0.9683***	***0.0675***
		n0	n0	n0	*
Both constant and Trend	t-Statistic	-2.0942	-1.8997	-3.3518	-3.0271
	Prob.	***0.5349***	***0.6382***	***0.0711***	***0.1367***
		n0	n0	*	n0
	At the first difference				
		d(LNRGEP)	d(LNRGDPP)	d(LNRGDP)	d(LNRCE)
With Constant	t-Statistic	-4.9354	-6.8669	-4.4012	-4.8826
	Prob.	***0.0002***	***0.0000***	***0.0011***	***0.0002***
		***	***	***	***
Both constant and Trend	t-Statistic	-4.8827	-7.6641	-4.4797	-4.8551
	Prob.	***0.0015***	***0.0000***	***0.0047***	***0.0016***
		***	***	***	***
Notes:					
c: Probability based on MacKinnon (1996) one-sided p-values.					

Source: Author's estimation

Note:(*) indicates significance at 10 percent level, (***) shows 1 percent level of significance, Lag length criterion is SIC.

The table above displays the results of the ADF unit root test with intercept, as well as the intercept and trend. All variables at the level with both intercept and trend have a lower absolute t-value than the crucial value of MacKinnon (1996) at the 5% level of significance. At the same time, the p-value for each variable is greater than 0.05. However, the situations alter when the initial difference between each variable is calculated and stationarity is checked. In the first difference situation, all of the variables under investigation are stationary. It demonstrates that all of the variables are in the same order as I(1) at the 1% level of significance.

Table 3: Unit Root Test Result by Phillips-Perron Method

Null Hypothesis: the variable has a unit root					
		At Level			
		LNRGEP	**LNRGDPP**	**LNRGDP**	**LNRCE**
With Constant	t-Statistic	-0.8999	2.3527	0.3723	-2.7091
	Prob.	***0.7793***	***0.9999***	***0.9795***	***0.0804***
		n0	n0	n0	*
Both constant and Trend	t-Statistic	-2.3153	-1.8128	-3.1890	-2.7605
	Prob.	***0.4174***	***0.6819***	***0.0996***	***0.2188***
		n0	n0	*	n0
		At the First Difference			
		d(LNRGEP)	d(LNRGDPP)	d(LNRGDP)	d(LNRCE)
With Constant	t-Statistic	-4.7652	-6.8652	-7.9695	-4.6004
	Prob.	***0.0003***	***0.0000***	***0.0000***	***0.0006***
		***	***	***	***
Both Constant and Trend	t-Statistic	-4.7013	-8.0189	-7.9928	-4.6271
	Prob.	***0.0024***	***0.0000***	***0.0000***	***0.0030***
		***	***	***	***
Notes:					
b: Lag Length based on SIC					
c: Probability based on MacKinnon (1996) one-sided p-values.					

Source: Author's estimation

Note:(*) indicates significance at 10 percent level, (***) shows 1 percent level of significance, Lag length criterion is SIC.

The table shows Phillips-Perron's unit root test with intercept and trend. The findings indicate that all variables are stationary at the first difference level of significance. Because all of the variables are stationary at first difference, we cannot apply ordinary least squares (OLS), which is false regression. If all of the variables are stationary at first difference, the Engle-Granger cointegration test is applied. However, if the model's variables are mixed in the correct sequence, the ARDL model is adequate for integration. The Engle-Granger co-integration test is used in this case study.

Engle-Granger's Cointegration Test

As the variables of both Peacock-Wiseman (1961) and Gupta (1967) are I (1) so the best model of co-integration in Engle-Granger Model (EGM). It is very useful for two variables and both versions have also two variables. After finding appropriate lag length it has to follow four steps. In the first step check the variables are integrated in same order or not. If they are integrated in same order then the co-integration test can be applied. In second step, ordinary least square (OLS) is estimated. In third step, residuals are extracted and checking its stationarity at level. If the stationarity is found the variables of the models are said to be co-integrated. And it can be said that the variables have the long-run relationship. The last step is to operate error correction model (ECM) to diagnose the short-run and long-run coefficient as well as estimate error correction factor.

Lag Selection Criterion

The Engle-Granger cointegration test is quite sensitive to the ideal lag. (Agunloye, Shangodoyin, 2014). To capture the long-run link between the variables, the research must employ the variable's lag value. To accomplish this aim, the study used an unrestricted VAR. There are several criteria for selecting the appropriate lag, including FPE (Final Prediction Error), Akaike Information Criterion (AIC), Shwarz Information Criterion (SC), and Hannan-Quinn Information Criterion (HQ). FPE and AIC outperform the other criteria for small samples (Liew, 2004). The following tables carry the suitable lag length for Peacock-Wiseman (1961) and Gupta (1967) versions of Wagner's law.

Table 4: VAR lag order selection criteria

Endogenous variables: LNRCE LNRGDP						
Sample: 1974 -2020						
Included observations: 42						
Lag	**LogL**	**LR**	**FPE**	**AIC**	**SC**	**HQ**
0	-42.02005	NA	0.027888	2.096193	2.178939	2.126523
1	106.8101	276.3989	2.82e-05	-4.800482	-4.552244*	-4.709493
2	112.2680	9.616331	2.64e-05	-4.869907	-4.456176	-4.718258
3	120.6657	13.99613*	2.15e-05*	-5.079320*	-4.500097	-4.867012*
4	122.3721	2.681446	2.41e-05	-4.970100	-4.225384	-4.697132

* informs lag order selected by the given criterion				
LR: sequential modified LR test statistic (each test at 5% level)				
FPE: Final prediction error				
AIC: Akaike information criterion				
SC: Schwarz information criterion				
HQ: Hannan-Quinn information criterion				

Source: Author's estimation

As the variables of Peacock-Wiseman (1961) are co-integrated at I (1), Engle-Granger co-integration test is applied. Engel-Granger suggested for checking residuals of the model. The residuals series of the above model is shown in appendix. The ADF test result for the residuals series are shown below.

Table 5: ADF Test Result of Residuals

Null Hypothesis: RESID02 has a unit root				
Lag Length: 1 (Automatic - based on AIC, maxlag=3)				
			t-Statistic	**Prob.***
Augmented Dickey-Fuller test statistic			-2.999369	0.0036
Test critical values:	1% level		-2.618579	
	5% level		-1.948495	
	10% level		-1.612135	
*MacKinnon (1996) one-sided p-values.				

Source: Author's estimation

By using optimal lag 3 as suggested by the lag selection criterion, the absolute value of ADF test statistic in the above table is 2.99. This statistic is not compared with the critical value given in the table. Engle-Granger (1987) provided their own critical values which are shown below.

Table 6: Engle-Granger Critical Values

Lags	**1%**	**5%**	**10%**
No lags	-4.07	-3.37	-3.3
Lags	-3.73	-3.17	-2.91

Source: Engle-Granger (1987)

As the calculated ADF statistic is more than critical values of Engle-Granger (1987) at 10 percent level of significance, the variables lnRCE and lnRGDP are co-integrated each other. From table 4.6, as the coefficient is 0.42, it indicates that when 1 percent rise in real gross domestic product there will be 0.4 percent rise in real government capital expenditure. From this it can be inferred that the government capital spending increases due to more demand of infrastructure development which is resulted from the rise in real GDP.

Error Correction Model

it is the final step of co-integration by EGM model is to estimate error correction model (ECM). The table below shows the result of ECM.

Table 7: Result of Error Correction Model

Dependent Variable: D(LNRCE)				
Method: Least Squares				
Sample (adjusted): 1976 2020				
Included observations: 45 after adjustments				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	-0.022961	0.050936	-0.450785	0.6545
D(LNRGDP)	1.435377	1.046721	1.371308	0.1776
E(-1)	-0.223009	0.080320	-2.776493	0.0082
R-squared	0.168868	Mean dependent var		0.037244
Adjusted R-squared	0.129291	S.D. dependent var		0.191280
S.E. of regression	0.178486	Akaike info criterion		-0.544268
Sum squared resid	1.338011	Schwarz criterion		-0.423823
Log likelihood	15.24602	Hannan-Quinn criterion.		-0.499367
F-statistic	4.266755	Durbin-Watson stat		1.442133
Prob(F-statistic)	0.020562			

Source: Author's estimation

From the above table it is clear the error correction term (ECT) (coefficient of E(-1)) has negative sign and also significant which is desirable. It hints that the ECT corrects the disequilibrium of system at the speed of 22 percent annually. But the coefficient of LNRGDP is insignificant as its p-value of coefficient is more than 0.05. It suggests that there may not be short run relationship between the variables under study. It demands further research.

Residual Diagnostic and Stability Test

Even though there is not short-run relationship between the variables, there is co-integration since residual series is stationary. In this reason, the in this section, residual diagnostic and stability of the model is going to check. Under residual diagnostic serial correlation, heteroskedasticity test and normality test are competed. Under stability test Ramsey RESET, CUSUM and CUSUMQ tests are contended.

Serial Correlation LM test

Table 8: Breusch-Godfrey Serial Correlation LM Test:

F-statistic	38.11414	Prob. F(2,42)	0.0000
Obs*R-squared	29.65873	Prob. Chi-Square(2)	0.0000

Source: Author's estimation

From the above table it is found that there is problem serial correlation in the model because the p-value of F-statistic is less than 0.05 and the null hypothesis states the presence of serial correlation.

Heterskedasticity Test

Table 9: Breusch-Pagan-Godfrey Heteroskedasticity Test Result

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.798952	Prob. F(1,44)	0.3763
Obs*R-squared	0.820372	Prob. Chi-Square(1)	0.3651
Scaled explained SS	0.399029	Prob. Chi-Square(1)	0.5276

Source: Author's estimation

The above test result indicates that the F-statistic is not significant at the 5% level of significance, as the p-value is greater than 0.05. It suggests the series is not heteroskedastic, implying that the disturbance factor in the model is homoscedastic.

Normality Test

The Jarque-Bera normality test checks whether the residuals of the model are normally distributed or not. The test result is shown below.

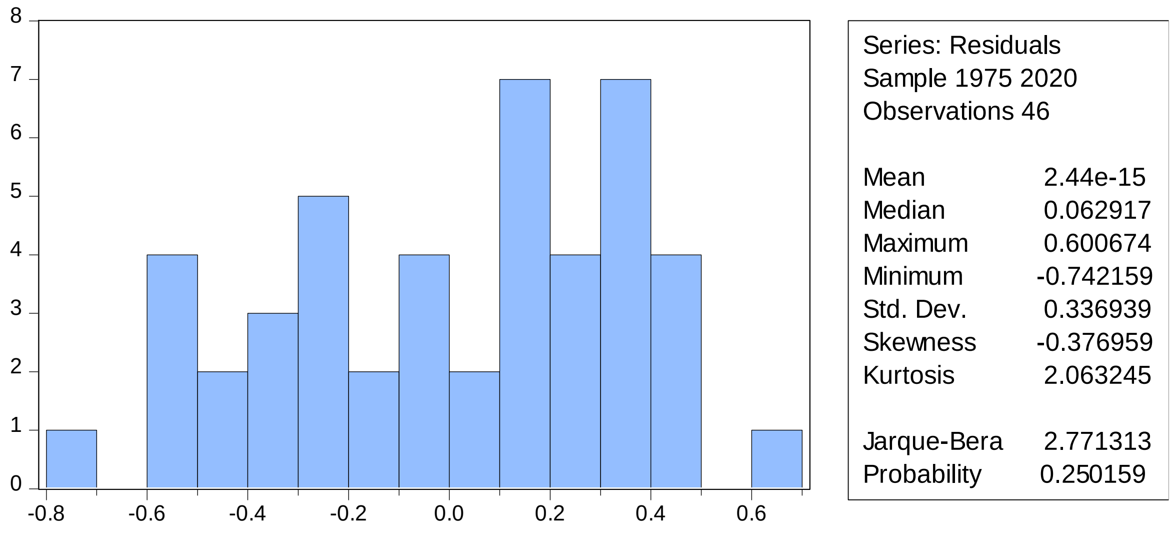


Figure 2: Normality test

The above table shows that the probability value for the Jarque-Bera statistic is more than 0.05 so that the residuals of model are normally distributed.

The overall result of diagnostic test of residual of the model shows that residuals are serial correlated, they are normally distributed, and they are free from heterskedasticity.

Ramsey Reset Test

Since the calculated T-value and F-value is more than 0.05, so we can accept the null hypothesis that the model of Peacock-Wiseman (1961) is correctly specified (Table 10).

Table 10: Test Result for Ramsey RESET Test

Ramsey RESET Test			
Specification: LNRCE LNRGDP C			
Omitted Variables: Squares of fitted values			
	Value	df	Probability
t-statistic	1.326976	43	0.1915
F-statistic	1.760865	(1, 43)	0.1915
Likelihood ratio	1.846168	1	0.1742

Source: Author's estimation

CUSUM and CUSUMQ test

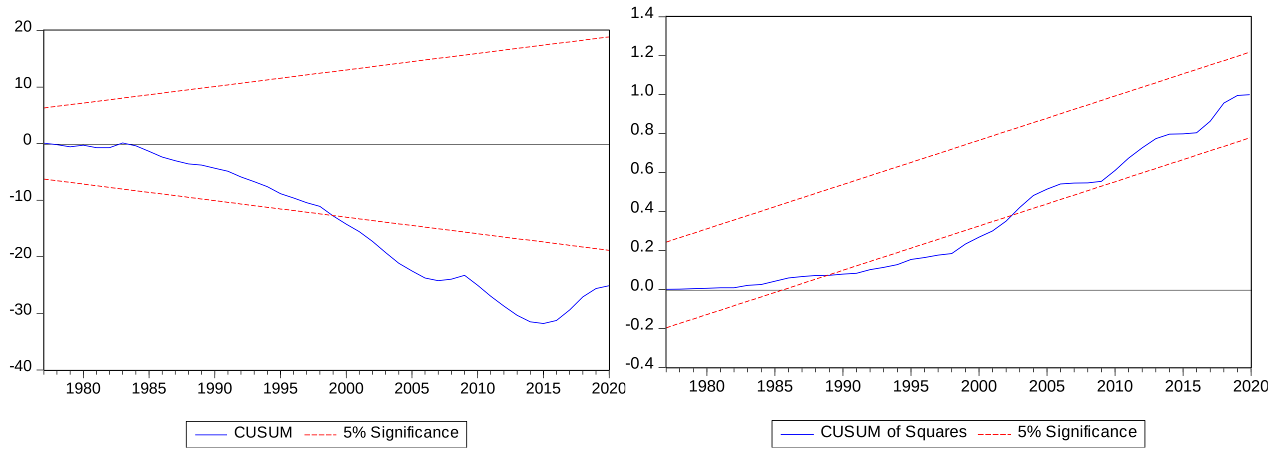


Figure 3: CUSUM and CUSUMQ plot

From the above figure, the CUSUM plot is deviated from the 5 percent level of significance from 2000 and it shows the instability in the model.

Granger Causality Test

Now the next step is to check the causality between the government expenditure and real GDP. In order to check the causality, the research has taken the pairwise Granger-causality test. To do this, the first difference of each variable is calculated.

Table 11: Granger Causality Test

Pairwise Granger Causality Tests			
Sample: 1975 2020			
Null Hypothesis:	Obs	F-Statistic	Prob.
DLNRGDP does not Granger Cause DLNRCE	42	1.32342	0.2823
DLNRCE does not Granger Cause DLNRGDP		0.51373	0.6755

Source: Author's estimation

As shown in the data, the P-values for both null hypotheses are more than 0.05, indicating that there is no causal association between government capital expenditure and real GDP. It concludes that both are independent variables.

5. Discussion and Conclusion

The primarily concern of this paper is to seek the relationship between the government expenditure and GDP.In this regard, the paper has taken the different variables such as real GDP, capital expenditure, per capita GDP, and per capita government expenditure to use the Engel-Granger co-integration test. The result has suggested that there is a long run relationship between capital expenditure and real GDP as well as per-capita government expenditure and per capita GDP are co-integrated. It has indicated that when real GDP is increased by 1 percent there will be 0.4 percent rise in capital expenditure at 10 percent level of significance. Besides, ECM has suggested that the deviation will be corrected annually at the rate of 22 percent annually. Although the model has some problem of auto correlation and instability the residuals are normally distributed, homoscedastic and model is specified. Similarly, when per capita GDP increases by 1 percent, per capita government expenditure is increased by 1.48 percent in long run 0.7 percent increase in short-run. The dis equilibrium is corrected annually at the rate of 26 percent. Finally, the model is qualified in the residual diagnostic, specification and stability test except auto correlation.The Granger causality test resulted that the variables are independent to each other.

Even though there are differences in the elasticity the result for both versions are similar for some reviewed literature such as Acharya (2016), Pryol (1968), Musgrave and Peacock (1969), and Mann (1980). On the other hand, the results are opposite for some literature like Olayungbo and Olayemi (2018), Menyah and Rufael (2013), Kaur (2016), Jena (2017). The result for the second objective is basically different from most of the previous studies because it has established the relationship between growth with public expenditure and governance. Incorporating with good governance the result of this thesis is akin to Bahaddi and Karim (2017). But there is the absence of a causal relationship between the variables of both versions which is also different from the previous studies.

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