Impact of Government Expenditures on Economic Growth: Case of Nepal

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ABSTRACT

This paper aims to explore the impact of government expenditure on economic growth of Nepal. To attain this purpose, annual time series data for the periods between financial years 1974/1975 to 2017/2018 were tested using Johansen Cointegration approach, Vector Error correction model, Granger Causality test. The result showed the logn-run relationship exists between government expenditure and economic growth. And also found short-run relationship between the variables in Nepal. On the other hand, it was found strong evidence for no causality between individual levels of each variable. However, unidirectional causality was found from current expenditure and capital expenditure, without any causality between other variables. These results suggest both current and capital expenditure should be utilized simultaneously for the growth of economy in Nepal.

Key Words: Economic Growth, Capital expenditure, Current expenditure Unit-root, Cointegration

1. Introduction

There has been a lot of discussing on the role and therefore the size of state intrusion within the political economy in a macro level throughout countries. As a result, governments arrange to stimulate economic process through completely different instruments. Public expenditure has historically been element of economic policy that is associate instrument of the state to influence economic activities.

Economic process as associate indicator of economic performance inside a rustic is taken into account as associate objective that the majority of the countries would anticipate as a result of its impact in raising the standards of living, the state advantages, and therefore the employment levels. Hence, understanding the determinant factors capable of inflicting economic process is crucial. Government expenditure is one amongst the foremost necessary factors in theory.

Fiscal policy measures, consisting of focused authorities spending and taxation are one of the two essential sets of macroeconomic equipment at the disposal of governments to enhance growth, enhance macroeconomic stability, and form sustainable social outcomes. Along with the economic policy measures frequently set by the central banks to make certain steadiness of costs and manage credit score flows, fiscal policy is central for directing macroeconomic performance and bettering possibilities for boom over the short, medium and long-term.

In the wake of the 2008 to 2009 economic crisis, the use of fiscal coverage measures to re-ignite growth and enhance possibilities for residents has emerge, with a renewed hobby in the possible use of authorities spending to mitigate the effects of decelerating financial activity, trade and altering patterns of consumption. One such macroeconomic methodology or policy analysis device to resource in the planning of government initiatives and the sketch of fiscal policy is the fiscal multiplier, described as the trade in the expected overall monetary endeavor or output for a given change in a fiscal coverage instrument, such as government spending (total, current, or capital) and revenues.

In context of Nepal, the size of the budget deficit has increased as has the size of government expenditure. In the current fiscal year 2017/18, the budget deficit of the federal government is expected to increase by three percentage point, leveling to 10.4 percent of GDP. In the first eight months of the current FY, total government expenditure has increased by 45.1 percent to Rs. 529.07 billion compared to the corresponding period of the previous fiscal year. During this period, the current expenditure has increased by 37.4 percent to Rs. 403.12 billion. Capital expenditure has increased by 38.9 percent to 94.24 billion in the first eight months of the current FY as compared to the corresponding period of previous fiscal year. Nepalese economy is estimated to expand by 5.9 percent in the current FY 2017/18. It was 7.4 percent in FY 2016/17. Due to the improvement in trade and service sector, non-agricultural sector is estimated to expand by 7.1 percent in FY 2017/18. Overall economic activities are oriented towards positive directions as a result of conducive environment in investment due to stable government formed after the election of three tiers of government (Economic Survey, 2018).

In FY 2017/18, gross fixed capital formation at current prices is estimated to be Rs. 1025.65 billion with 22.0 percent growth. The share of gross fixed capital formation to GDP, which stood at 31.8 percent in previous FY, is estimated to remain at 34.1 percent in FY 2017/18. The share of private and government sectors to gross fixed capital formation is estimated to stand at 77.2 percent and 22.8 percent respectively in the current fiscal year. Such shares were 79.8 percent and 20.2 percent, respectively, in the FY 2016/17 (Economic Survey, 2018). Having a glance regarding the current situation of public spending the research question for study is whether increasing public expenditure is contributing the economic growth of Nepal or not. Thus, this paper aims to examine the impact of public expenditures on economic growth of Nepal.

2. REVIEW OF LITERATURE

Several studies have examined the relationship between the economic growth and the share of government spending and find diverse results. For example, Landau (1983), in a cross-section study of over 100 countries in the period 1961-76, reported evidence of a negative relationship between the growth rate of real per capita GDP and the share of government consumption expenditure in GDP. By contrast, Ram (1986), utilizing a two-sector model, in a cross-section study of 115 countries and in the two-decade period from 1960 through 1980, found that growth of government size has a positive effect on economic growth. Barro (1991) reports mixed results. In his cross-section study of 98 nations between the years 1960 and 1985, he found that increases in government consumption expenditure measured as a percent of national income reduce per capita growth. However, when the share of public investment was considered, Barro found a positive but statistically insignificant relationship between public investment and the output growth rate.

Singh and Sahni (1984), using the Granger-Sims methodology, initially examined the causal link between government expenditure and national income in a bivariate framework. Their empirical results, based on data for India, suggest that the causal process between public expenditure and national income is neither Wagnerian nor Keynesian. Similarly, Ahsan, Kwan, and Sahni (1992) have used the same approach, but in a tri-variate framework. Their interesting results indicate that while the US data fail to detect any causality between public expenditure and national income at the bivariate level, there was strong evidence of indirect causality from GDP to public spending via both money stock and budgetary deficits. Bohl (1996) applied tests of integration, cointegration and Granger causality in a bivaritate context. Hondroyiannis and Papapetrou (1995), and Chletsos and Kollias (1997), applied the same methodology in Greece, and found mixed results. To our knowledge, Ghali's (1998) study is the only one that uses multivariate co-integration techniques, and examines the dynamic interactions between government size and economic growth in a five-variable system.

3. METHODOLOGY

Secondary data were used for the analysis in this study. Annual data on Real GDP, Current expenditure, and capital expenditure from 1974/1975 to 2017/2018 are used for this paper. Real GDP, current expenditure and capital expenditure data are collected from ministry of finance's website of Nepal. All the data used in this study are in natural logarithmic form. Log transformation reduces the problem of heteroscedasticity in time series data (Gujarati, Porter, & Gunasekar, 2012). We use LGDP, LCUX, and LCAX for real GDP, Current expenditure and capital expenditure respective LGDP. The main purpose of this study is to investigate the effect of current expenditure (LCUX) and capital expenditure (LCAX) on economic growth (LGDP) in Nepal. The model specification for the econometric anaLGDPsis is shown in Eq. (1).

$LGDPt = \beta 0 + \beta 1LCUXt + \beta 2LCAXt + \varepsilon t$ (1)

Where

LGDP= Log of Annual GDP

LCUX= Log of Annual Current expenditure

LCAX= Log of Annual Capital expenditure

$\beta 0$= Intercept

$\beta 1$ and $\beta 2$ = Coefficients

εt= Stochastic error term

In regression model (1), GDP is used as a dependent variable. GDP, current expenditure and capital expenditure are measured in ten million of Nepalese rupees. Data were analyzed using EViews10 software.

3.1 Unit Root Test

At first, we determined that whether our variables used are stationary or not. Autocorrelation results because the underlying time series is nonstationary (Gujarati, Porter, & Gunasekar, 2012a). If variables are non-stationary, in such case the issue is to what degree they are integrated. We use Augmented Dickey-Fuller (ADF) test to test the stationarity of the variables. If the calculated statistic is less then critical value, then variables are said to be stationary or integrated to order zero or can be written as I(0).

If data are non stationary at I(0), then ADF test is executed on the first difference of X (i.e. ΔX). If ΔX is found to be stationary, then the series is said to be integrated to order 1 i.e I(1). The macro economic factors faced the huge structural and political changes during the study period. Thus, the use of ADF test for checking the stationary property of the variables might mislead the results. A strucutral change in the mean of a stationary variable tends to bias the standard ADF test toward non-rejection of a hypothesis of a unit root (Perron, 1989). Therefore, we performed the Phillips Perron (PP) unit root test also to check the stationarity of the data set used in the study.

3.2 Cointegration Test

After integrating all variables used in multivariate model of order one i.e. I(1), we need to find whether they are cointegrated or not using Johansen's framwork. Gujarati, Porter, & Gunasekar, (2012) told that two variables will be cointegrated if they have long-term relationship between them. Consider an unrestricted VAR model up to k lags in which the process Xt, for tiven values of X-k+1………..X0, is defined by

$$Xt = \alpha + \Pi 1Xt\text{-}1 + \ldots\ldots + \Pi\ kXt\text{-}1 + \varepsilon t \qquad (2)$$

Where εt is independentLGDP and identicalLGDP distributed white noise error term, Xt is a vector of I(1) variables and α is a vector of constant. Since, Xt non stationary, the above equation can be expressed in first differenced error-correction form.

$$\Delta Xt=\alpha+\Gamma 1Xt\text{-}1+\ldots\ldots+ \Gamma k\text{-}1\Delta Xt\text{-}k\text{-}1+ \Pi\ kXt\text{-}k+\varepsilon t \qquad (3)$$

Where

ΓI = -(1- Π 1-……..Π i), i= 1, 2,3….. k-1 Π = -(1- Π 1-……….Π k)

Eq. (3) is expressed as a traditional first difference VAR model except the term Π Xt-k. The coefficient matrix Π contains information about long run relationship between variables in the data vector. These are 3 possible cases. If the rank of Π equals p, i.e. the matrix Π has full rank; the vector process Xt is stationary. If the rank of Π equals 0, the matrix Π is a null matrix and the above equation corresponds to a traditional differenced vector time series model. FinalLGDP, if 0<r<p there exist r co-integrating vectors; in that case Π=αβ', where α and β are p × r matrices. The cointegrating vectors β have the property that β'Xt have is stationary even though Xt itself is non-stationary. In this case Eq. (3) can be interpreted as an error-correction model.

Johansen (1988) and Johansen & Juselius (1990) derived the likelihood ratio test for the hypothesis of r cointegrating vectors or Π = αβ'. The co-integrating rank, r, can be tested with two statistics, nameLGDP Trace and Maximal Eigen Value. The likelihood ratio test statistics for the null hypothesis that there are most r co-integrating vectors against the alternative of more than r co-integrating vectors is the trace test and is computed as;

$$\text{Trace} = \text{-T} \sum_{i=r+1}^{p} Ln(1-\lambda_i) \qquad (4)$$

Where $\hat{\lambda}$r+1 ……….$\hat{\lambda}$p are p-r smallest estimated Eigen values. The likelihood ratio test statistic for the null hypothesis of r cointegrating vectors against the alternative of r+1 cointegrating vectors is the Maximal Eigen value test and is given by

$$\lambda max = \text{-T}[\ln(1\text{-}\lambda i)] \qquad (5)$$

Here, T is the sample size and λi is the ith largest correlation. The trace test tests the null hypothesis of n co-integrating vectors. The maximum Eigen value test tests the null hypothesis of cointegration vectors against the alternative hypothesis of r+1 cointegrating vectors.

3.3 Vector Error Correction Model:

If cointegration is established to exist, then the third step entails the construction of error correction mechanism to model dynamic relationship. The purpose of the Vector Error Correction Model is to designate the speed of adjustment from the short-run equilibrium to the long-run equilibrium state. The greater the co-efficient of the parameter, the higher the speed of adjustment of the model from the short-run to the long-run. We represent following equations with an error correction form that allows for inclusion of long-run information thus, the Vector Error Correction Model (VECM) can be formulated as follows;

$$\Delta LGDPt = \sum_{i=1}^{n} \alpha 11 \Delta LGDP\ t\text{-}1 + \sum_{i=1}^{n} \alpha 12 \Delta LCUX + \sum_{i=1}^{n} \alpha 13\ \Delta LCAX + \delta 1EC1t\text{-}1 + \varepsilon t1 \quad (6)$$

$$\Delta LCUXt = \sum_{i=1}^{n} \alpha 21 \Delta LGDP\ t\text{-}1 + \sum_{i=1}^{n} \alpha 22 \Delta LCUX + \sum_{i=1}^{n} \alpha 23\ \Delta LCAX + \delta 2EC2t\text{-}1 + \varepsilon t2 \quad (7)$$

$$\Delta LCAXt = \sum_{i=1}^{n} \alpha 31 \Delta LGDP\ t\text{-}1 + \sum_{i=1}^{n} \alpha 32 \Delta LCUX + \sum_{i=1}^{n} \alpha 33\ \Delta LCAX + \delta 3EC3t\text{-}1 + \varepsilon t3 \quad (8)$$

Where Δ is the difference operator; n, is the numbers of lags, α are short-run coefficients to be estimated, EC1t-1 represents the error correction term derived from the long-run co integration relationship and ε1t the serially uncorrelated error terms in above equation.

4. Study Results and Discussion

4.1 Unit Root Test Result:

As a first step, non-stationarity of data set is addressed using a standard Augmented Dickey-Fuller (ADF) test. The ADF unit root test was applied on two sets, being constant and constant with trend. The result of ADF test is presented in table No. 1

Table No: 1

Augmented Dickey Fuller (ADF) Test Results

Variables	ADF (Constant)		ADF (Constant & Trend)	
	Level	1st Diff.	Level	1st Diff.
LGDP	-0.27580	-6.5124***	-1.6993	-6.43100***
LCUX	0.2062	-6.56420***	-2.2131	-6.4961***
LCAX	-0.5766	-4.96449***	-2.1602	-4.8913***

*Superscripts ***,** and * indicate rejection of null hypothesis at 1%, 5% & 10% level of significance*

The results show that LGDP, LCUX and LCAX variables are non-stationary at level in both constant and constant & trend. Since, the ADF test showed all the variable stationary in 1st difference at 1% level of significance.

4.2 Johensen Cointigraion Test Results:

Since all the variables are I(1), we can used the Johensen cointigraion model for this data to examine the long term relationship among variables. The optimal lag length of the level VAR system is determined 4 lag using the Akaike's Information Criterion (AIC). Further the Correlogram analysis also supports the facts that all the variables used in the model are non-stationary at level and when they converted into first difference then all became stationary. That mean all our 3 variables are integrated of same order. Now, the door opened for Johensen test of cointigraion.

Since, all variables are integrated of order 1, i.e. I (1), we can test whether they are cointegrated or not (Engle & Granger, 1987). We here test for the number of cointegrating relationship using the approach proposed by Johansen (1988) and Johansen & Juselius (1990).

Table No. 2

Johansen Cointegration Test Results

Unrestricted Cointegration Rank Test (Trace)

Hypothesized no Of CE(s)	Eigenvalue	Trace Statistic	Critical Value	Prob.**
None*	0.3620	30.2868	29.7970	0.0438
At Most 1	0.2531	12.7541	15.4947	0.1241
At Most 2	0.0345	1.3699	3.8414	0.2418
Unrestricted Cointegration Rank Test (Max-Eigen Value)				
Hypothesized no Of CE(s)	Eigenvalue	Max-Eigen Statistic	Critical Value	Prob.**
None*	0.36208	17.5326	21.1316	0.0148
At Most 1	0.2531	11.38420	14.26460	0.1359
At Most 2	0.0345	1.3699	3.84146	0.2418

*Superscripts ***,** and * indicate rejection of null hypothesis at 1%, 5% & 10% level of significance*

The table No. 2 depicted the results of Johansen Cointegration test. Results of both Trace and Maximum Eigenvalue tests reject the null hypothesis of no cointegrating relation. It suggests that the existence of at least 1 cointegrating relationship among the variables in the series at 5% level of significance. This implies that the series under consideration are driven by at least 1 common trend. Hence, the long run equilibrium relationship between LGDP, LCUX and LCAX.

4.3 Vector Error Correction Model (VECM):

Since, variables have long run relationship, VECM model is eligible for further analysis. The term error-correction relates to the fact that last-period deviation from a long-run equilibrium, the error, influence its short-run dynamics. Imposing known unit roots and known cointegration restrictions VECM may improve the power of statistical test such as Granger causality test (Lütkepohl & Reimers, 1992). This study uses VECM model as reconfirmation of the cointegrating relationship among the variables to estimate the long run causality between LGDP, LCUX and LCAX.

Table No. 3

VECM Test Results

Error Correction	D(LGDP)	D(LCUX)	D(LCAX)
Cointegration Equation-1 (C1)	-0.4331***	0.1190	0.3633
Standard Error	0.1395	0.2571	0.6068
T-Statistics	-3.1046	0.4629	0.5988
D(LCUX)	-0.1340	-0.2348	0.5152
Standard Error	0.1264	0.2330	0.5499
T-Statistics	-1.0601	-1.0077	0.9370
D(LCAX)	-0.0104	0.1795*	0.3204
Standard Error	0.0533	0.0983	0.2321
T-Statistics	-0.1959	1.8242	1.3802

*Superscripts ***,** and * indicate rejection of null hypothesis at 1%, 5% & 10% level of significance*

In the above table No. 5, C(1) is error correction term or speed of adjustment towards equilibrium. The coefficient C(1) is negative and significant, this implies that there is long run causality running from LCUX and LCAX to LGDP. It shows that the result conformed to our prior expectation. The adjustment coefficient or the speed of adjustment of GDP is not deviated from its long run equilibrium and error correction term is -0.4331 and P-value is 0.043 which is less than 0.05 level of significant.

4.4 Granger Causality Test

Series X causes Y if the past values of X can more accurately predict Y than simply the past values of Y (Granger, 1969). Here, the directions of causality between LGDP & current expenditure (LCUX), LGDP & capital expenditure, and current expenditure and capital expenditure have been tested using Granger Causality test.

Table No: 4

Granger Causality Test

Null Hypothesis	F-Statistics	P-value
LCUX does not Granger Cause LGDP	0.7843	0.5440
LGDP does not Granger Cause LCUX	0.3779	0.8225
LCAX does not Granger Cause LGDP	1.9740	0.1230
LGDP does not Granger Cause LCAX	1.1831	0.3375
LCAX does not Granger Cause LCUX	5.0082***	0.0031
LCUX does not Granger Cause LCAX	2.1542	0.0976

*Superscripts ***,** and * indicate rejection of null hypothesis at 1%, 5% & 10% level of significance*

The above Table No. 4 indicates that the causality does not transfers from LGDP to LCUX & LCAX since there is no evidence for the null hypothesis is rejection. Similarly LCUX and LCAX do not cause the LGDP in long run as the p-value of corresponding F-statistic did not reject the null hypothesis that LCAX and LCUX doesn't Granger Cause. No causality is found from LCUX to LCAX as the p-value of corresponding F-statistic fails to reject the null hypothesis of LCUX doesn't Granger Cause LCAX. However, causality found from LCAX to LCUX as F-statistic corresponding P-value rejects the null hypothesis of LCAX does not Granger cause LCUX.

5. CONCLUSION

In this study, we examined the dynamic causal relationship among Economic Growth, and government expenditure for Nepal in the period of 1974/1975-2017/2018. For the existence of long run relationship among variable, Johansen Cointegration test was used, while directional causality was tested with Granger Causality test. The result of cointegration test showed that there is 1 cointegration vector which clarifies the existence of long-run relationship among the variables. It mean independent variables have significant effects of economic growth of Nepal. Similarly, VECM result showed the short-run and long run causality running from current expenditure and capital expenditure to GDP. The result of Granger causality test shows that there is unidirectional relationship between current expenditure and capital expenditure. But there is no any causality between economic growth and current expenditure. This study suggests for policy making that Nepal must focus on both current and capital expenditure simultaneously for economic growth. The results confirms that capital expenditure and current expenditure individually don't push the economic growth. However, if both are utilized simultaneously the economic growth will be pushed up.

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