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Deficit Budget and Economic Growth in Nepal

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ABSTRACT

This article attempts to identify the relationship between budget deficit and economic growth in Nepal. A deficit budget is associated with the role of government in the economy. On employing the ARDL bounds test on the data set from 1990 to 2020, it is found that there is a long-run relationship between the budget deficit and economic growth. The bound test and error correction term specify a long-run relationship between the Nepalese economy's budget deficit and economic growth. According to the empirical study, the budget deficit significantly impacts real GDP, a proxy for economic growth.

1. INTRODUCTION

A deficit budget is associated with the role of government in the economy. The concept of a deficit budget strongly originated after the Great Depression of 1930. Before it, classical economists prescribed that a balanced budget was best for the economy and that the government should have a minimum role. The classical economists argued for the self-adjusting tendencies of the economy. Government policy ensures classical economists consider an adequate demand for output unnecessary (Froyen, 2014). But after 1930, the leading spirit of classism does not become actual or classist views do not work. In 1936, the prominent economist John Maynard Keynes wrote "The General Theory of Employment Interest and Money." He has advocated

the role of government in the economy and suggested that government expenditures boost the economy from depression to recovery and maintain stability.

Government deficit decreases national saving, which is induced to increase the interest rate and decrease private investment, known as the crowding-out effect. On the other hand, an increase in interest rate leads to international capital inflow, resulting in a trade deficit through currency appreciations. But the capital inflow is insufficient to offset the private investment (Ball & Mankiw, 1995). Hence, the deficit budget doesn't have a single effect on the economy. However, the classical economist concludes that the government deficit has an inverse impact on the economy, thereby living standard of the people. By contrast, a decrease in the national savings increases aggregate demand, which courage to use more of their existing capacity. Over the long-term economy is in equilibrium with a higher level of national saving, investment, and economic growth (crowding-in effect).

On the other hand, if private savings rise by the same amount as the fall in public savings (equal to a deficit rise), there is no change in national savings and no further adjustment. It is referred to as the Ricardian Equivalence Hypothesis advanced by Barrow (Gale & Orszag, 2003). Increased government expenditure leads to higher economic growth (Barro, 1990). According to him, if the government spends on consumption services and not the government agent's consumption stimulates to increase the utility of consumer & productivity of the private sector leads to higher economic growth.

Foreign aid, internal borrowing, printing new currency and drawing on the country's accumulated cash, raising taxes, and so on are all options for funding the deficit budget. All deficit financing instruments have advantages and disadvantages, and better financing depends on the economy's macroeconomic indicators and fiscal space. One of the methods/ tools for financing a deficit budget is foreign aid. However, the researcher discovered debate among economists on the influence of foreign aid (excluding grants) on economic growth and development since the debt crisis of the 1980s in the economic literature. According to the debt overhang hypothesis, the government raises the tax rate on the private sector to pay off the accrued debt (as a means of transferring resources to the public sector). It will discourage private sector investment, and more government public spending on infrastructure decreases (Road construction, Telecom, Electric power supplies) as the available resource is used to pay debt obligation. As a result, overall investment (private and public investment) will decrease. According to Solow, when countries are forced to pay part of their external debt, they use their income from the export.

In some cases, transfer resources, including foreign aid and foreign exchange resources, to service their forthcoming debt; this is the case for the debt crowding-out effect. Countries that transfer income from export that can be used in investment towards debt payment will discourage public investment. This, in turn, will decrease economic growth (Ejigayehu, 2013).

Shah and Bhusal (2017) used ARDL bound test to identify the relationship between public growth and economic growth in Nepal from 1975 to 2016. The bound test and error correction terms clearly show a long-run relationship between government expenditure and economic development in the Nepalese economy. According to the empirical study findings, government spending significantly impacts real GDP, which is a proxy for economic growth. The analysis backs with the Keynesian notion of increasing government spending to increase Nepal's economic growth

Aslam (2016) studied the dynamic relationship between the budget deficit and the economic growth of Sir Lanka using annual time series data from 1959 to 2013. To evaluate the long and short-run dynamic link between Sri Lanka's budget deficit and economic growth, researchers used the Johansen cointegration technique and the Vector Error Correction Model. There was no short-run dynamic link between Sri Lanka's budget deficit and economic development during the study period. Furthermore, Sri Lanka's budget deficit was positively related to the country's economic growth.

Nayab (2015) used the Cointegration technique, VAR Granger Causality test and vector error correction model to examine the impact of budget deficit on economic growth in Pakistan during the period from 1976 to 2007. According to the findings, GDP causes investment, and investment causes deficit. On the other hand, the budget deficit does not affect GDP growth. The study's findings also support the Keynesian viewpoint on the budget deficit. The findings also show that the fiscal deficit positively affects growth.

Eminer (2015) studied the reasons for budget deficit or estimated the impact of budget deficit on economic growth or their causal relationships for North Cyprus. This study uses time-series secondary data for 28 years (1983-2010). The causal relationship between budget deficit and economic growth, in the long run, is tested by the Granger Causality test and with other econometric methods such as; Dickey-Fuller and Augmented Dickey-Fuller unit root tests. The Autoregressive Distributed Lag approach is also used to estimate the relation between all other variables. It was found that the major finding is similar to most of the Keynesian approach literature except for the significant causal relationship between non-productive expenditure and economic growth.

Bhusal (2013) used the error correction model to establish the relationship between high money supply and budget deficits with the inflation rate. It was found that long-run inflation is related to a high money supply and the budget deficit. There is a unidirectional causal relationship between money supply with inflation and similarly budget deficit with inflation, whereas the supply of money has no causal connection with the budget deficit.

Abd Rahman (2012) used the ARDL approach to study the relationship between budget deficit and economic growth from the perspective of Malaysia, utilizing quarterly data from 2000 to 2011. It was discovered that there is no long-term association between Malaysia's budget deficit and its economic growth. On the other hand, Productive expenditure has a

long-term positive link with economic growth. If a shock hits the Malaysian economy, the only variables that can help the economy return to equilibrium are changes in GDP and productive expenditures.

The study's general objective is to analyze the relationship between the deficit budget and economic growth in Nepal. However, the specific objectives are:

1. To analyze the short-run relationship between economic growth and budget deficit.
2. To analyze the long-run relationship between economic growth and budget deficit.

2. METHODOLOGY

2.1 Nature and Source of Data

In this study, the secondary data has been used obtained from Nepal Rastra Bank covering the period from 1990 to 2020 with a sample size of 31 years. To address the objective, economic growth has been employed as the dependent variable, and deficit budget as an independent variable, recurrent government expenditure and gross private capital formation are treated as control variables—the research is based on analytical research design.

2.2 Unit Root Test

A stochastic process with unit roots and structural breaks is a nonstationary time series. On the other hand, unit-roots are a crucial source of nonstationary. A unit root indicates that a time series is nonstationary, whereas the absence of one indicates that it is stationary. The variable or data is weakly stationary if it's mean and variance must be constant (not depending on time) over time; otherwise, the variable is nonstationary (Maddala & Kim, 1998). There are three renowned techniques to test whether the data has stationary or not? These techniques are the Argument Dickey-Fuller (ADF), Kwiatkowski-Phillips-Schmidt-Shin (KPSS) and Philips-Perron (PP) test. The ADF test has become most popular in the existing literature (Elder & Kennedy, 2001). So, the researcher goes through the ADF test to identify the nature of stationary or nonstationary data.

2.3 Model Specification

The nature of the data determines which model is acceptable for time series data analysis. So, the researcher first identifies the data series' trend, cycle, seasonality and a residual component. With the presence of these components, the level data becomes nonstationary. Therefore, first, we have tested the unit root, which answers whether the data are unit root or not? In other words, whether data are stationary or not? After testing unit root, it gives the idea about which model is appropriate for answering the underlying research question. Here the Autoregressive Distribution Lag model (ARDL) is chosen. An autoregressive distributed lag (ARDL) model contains lagged x_t's and lagged y_t's (Hill, Griffiths & Lim, 2011). The ARDL model gives a more robust result despite the small sample size (Nkoro & Uko, 2016). We can use this ARDL model for stationary as well as nonstationary (mixed) {except I(2)} variable nature of data.

This study has employed the following functional model to meet the research objective.

$RGDP = f(BD, PCF, RE)$

where *RGDP*, *PCF*, and RE refer to the real gross domestic product, private capital formation, and recurrent expenditure. The functional form shows that real gross domestic product is the dependent variable. Based on functional form, the log-linear model is further extended to

$$LNRGDP = \beta_0 + \beta_1 LNBD + \beta_2 LNPCF + \beta_3 LNRE + U_t$$

where *LNRGDP* = Natural Logarithm of real gross domestic product, *LNBD* = Natural Logarithm of the budget deficit, *LNPCF* = Natural Logarithm of private capital formation, *LNRE*= Natural Logarithm of recurrent expenditure, and U_t = error term

3. RESULT AND DISCUSSION

3.1 Unit Root Test and ARDL Bounds Test

The Augmented Dickey-Fuller (ADF) test is adopted for all the variables with the null hypothesis 'there is the presence of unit root. i.e., presence of nonstationary.'

Table 1

Augmented Dickey-Fuller (ADF) Test for Unit Root

Variable	Level		1st difference		Decision
	t-statistics	P-value	t-statistics	P-value	
LNRGDP	-0.331538	0.9086	-5.906929	0.0000	I(1)
LNBD	-1.156789	0.6746	-3.769587	0.0026	I(1)
LNPCF	-1.674590	0.4334	-4.783757	0.0006	I(1)
LNRE	-0.646182	0.8453	-4.964919	0.0004	I(1)

Source: Author's Calculation using E views 10 software

Table 1 shows that LNRGDP, LNBD, LNPCF and LNRE have unit root at their level, whereas after the first difference, they achieved stationary. Thus, the ARDL model could be applied without any hesitation.

Table 2 shows a significant relationship between the real GDP and the explanatory variables. The coefficient of the first lag value of LRGDP is statistically significant at 5.7 percent but has a negative sign. In addition, the LRBD, second, third, and fourth lag of LRBD are also statistically significant at below 5 percent. Moreover, LNPCF and the first lag of LNPCF are statistically significant at 1 percent, but the first lag of LNPCF has a negative sign. Similarly, LNRE is not statistically significant.

The result of ARDL (1, 4, 4, 0) estimation based on Akaike Information Criterion has $R^2 = 0.80$ and $^2 = 0.62$ is high, and the value of F-statistics is 4.4 with P-value 0.0063 implying the model is overall significant.

Table 2

Estimation of Short Run Error Correction Representation

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
D(LNRGDP(-1))	-0.377083	0.180581	-2.088168	0.0570
D(LNBD)	0.009643	0.006075	1.587405	0.1364
D(LNBD(-1))	0.000366	0.005064	0.072193	0.9435
D(LNBD(-2))	0.011383	0.004262	2.670444	0.0192
D(LNBD(-3))	0.014623	0.005346	2.735107	0.0170
D(LNBD(-4))	0.018675	0.008680	2.151418	0.0508
D(LNPCF)	0.072413	0.023931	3.025953	0.0097
D(LNPCF(-1))	-0.054508	0.029524	-1.846230	0.0877
D(LNPCF(-2))	-0.041133	0.025429	-1.617577	0.1297
D(LNPCF(-3))	0.007215	0.026951	0.267700	0.7931
D(LNPCF(-4))	0.058683	0.026367	2.225625	0.0444
D(LNRE)	-0.010072	0.018509	-0.544161	0.5955
C	0.050972	0.010100	5.046599	0.0002
R-squared	0.802434	Mean dependent var		0.042806
Adjusted R-squared	0.620065	S.D. dependent var		0.017634
SE of regression	0.010869	Akaike info criterion		-5.898882
Sum squared resid	0.001536	Schwarz criterion		-5.269834
Log-likelihood	89.68547	Hannan-Quinn criteria.		-5.717739
F-statistic	4.400066	Durbin-Watson stat		1.596638
Prob(F-statistic)	0.006349			

Note. ARDL (1,4,4,0) was selected based on the Akaike info criterion (AIC). Dependent Variable: D(LNRGDP)p-values and subsequent tests do not account for model selection.

To examine the existence of a long-run relationship between the variable, it is necessary to carry out an outbounds test. The bound testing approach uses the standard version of the F-test, also known as the Wald test. If the computed Wald or F-statistic lies outside the critical value bounds. In that case, a conclusive inference can be drawn without knowing the integration/ cointegration status of the underlying regressors. However, suppose the Wald or F-statistic falls inside these bounds. In that case, the inference is inconclusive, and knowledge of the order of the integration of the underlying variables is required before conclusive inferences can be made (Pesaran, Shin & Smith, 2001). The computed result of the bounds test is presented in Table 3.

Table 3

Result of ARDL Bounds Test.

Test Statistic	Value	Significance	I(0)	I(1)
F-statistic	12.47000	10%	2.37	3.2
k	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66

Table 3 shows that the calculated value of the F-statistic for the model is higher than the upper bound at a 1 percent significant level. So, there is a long-run relationship among the variable. To analyze the long-run relationship between the variable under the study, the estimated long-run model is presented in Table 4.

Table 4

Estimated Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNBD)	0.039714	0.009281	4.279284	0.0009
D(LNPCF)	0.030985	0.042041	0.737026	0.4742
D(LNRE)	-0.007314	0.013560	-0.539363	0.5988
C	0.037014	0.006169	6.000163	0.0000

Note. ARDL (1, 4, 4, 0) was selected based on Akaike Information Criterion. Dependent Varibale : LNRGDP.

The long-run coefficients are presented in table 4, which shows that the coefficient of LNBD is positive and statistically significant, which depicts the positive impact of budget deficit on the real gross domestic product, i.e., there is a long-run relationship between budget deficit and real gross domestic product. The coefficient of LNBD is 0.039714, which explains that a 1 percent increase in budget deficit leads to RGDP growth by 0.039714 percent. The coefficient of LNPCF and LNRE is not statistically significant. It implies no long-run association between private capital formation with the real gross domestic product and recurrent expenditure with real gross domestic product.

3.2 Stability Test

CUSUM and CUSUMSQ tests examine the stability of long-run coefficients together with short-run dynamics. Suppose the plot of CUSUM statistics stays within the critical bounds of the 5 percent significance level represented by a pair of straight lines drawn at the 5 percent level of the significance whose equations are given in (Brown, Durbin & Evans, 1975). In that case, It is not possible to reject the null hypothesis that all coefficients in the error correction model are stable. The CUSUMSQ test is performed similarly.

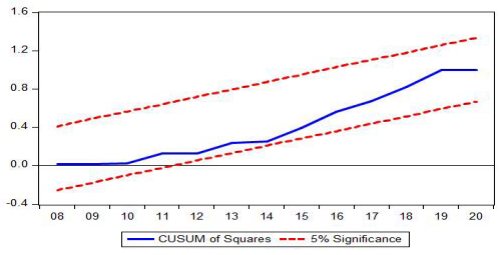

Figure 1(a) : Stability Tests- CUSUM Plots

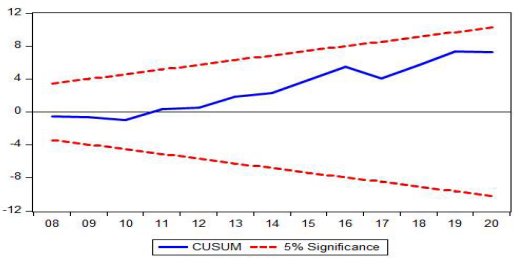

Figure 1(b) : Stability Tests- CUSUMSQ Plots

Source: Author's Calculation by using Eviews 10

Figures 1(a) and 1(b) show that the plots lie between the critical region at a 5 percent level of significance. As a result, the model is stable, indicating no evidence of significant structural instability.

4. CONCLUSION

From the analysis of the study, there is a significant relationship between a deficit budget on economic growth. Along with this objective, the study found the trend and patterns of deficit budget, economic growth, and other relevant variables. The ARDL approach to the bound test has found an empirical relationship. The real gross domestic product has an upward trend during the study period. The government's recurrent expenditure, private capital formation, and budget deficit also have an upward trend during the study period. Economic growth reflects the positive change in the GDP. Sustain economic growth induced to increase the welfare of the people. In 1990, the real GDP recorded Rs. 256509 million, and in 2020 the real GDP remained at Rs. 971500 million. The long-term trend of economic growth is upward trending means that economic growth increases over time.

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Appendix

Data of Real and Nominal GDP, Current and Capital Expenditure, Budget Deficit, Gross Private Capital Formation.

Amount Rs in Million

Year	Real GDP	Budget DEFICIT	Recurrent Expenditure	Private Capital Formation
1990	256509	-8381	5195	9034
1991	272839	-10656	5902	14097
1992	284048	-11262	6108	18945
1993	294974	-11956	6924	25509
1994	319219	-11623	7554	28652
1995	330291	-10518	13182	33300
1996	347921	-13824	14846	38457
1997	366225	-14362	16654	41402
1998	376999	-17778	19492	42802
1999	393903	-17991	31944	41381
2000	417992	-17667	35579	46888
2001	441518	-24188	45837	66687
2002	442049	-22938	48864	72450
2003	459488	-18128	52091	83354
2004	481004	-15828	55552	94226
2005	497739	-18047	61686	100326
2006	514486	-24780	67018	118023
2007	532038	-30092	77122	128692
2008	564517	-33407	91447	145453
2009	590107	-53335	127739	166761
2010	618529	-29002	186598	211223
2011	639694	-30417	210168	228924
2012	670279	-29827	243460	245629
2013	697954	-5933	247456	307586
2014	739754	-13277	303532	367034
2015	764336	-48352	339278	485568
2016	768835	-26771	364469	486792
2017	832060	-124132	513675	671150
2018	887817	-257271	696920	790450
2019	949886	-159800	716418	928579
2020	971500	-145589	701962	825624

Source : Nepal Rastra Bank