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Twin Deficit Hypothesis: A Study of Nepal

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Abstract

This paper aims to examine the causal relationship between the budget deficit and the current account deficit of Nepal using time series data sets for the period from 1975 to 2019. Based on the Autoregressive Distributed Lag (ARDL) Model, the empirical finding indicates that rising budget deficits put more stress on the current account deficits in the both long-run and the short-run. Furthermore, the Granger Causality test reconfirms that unidirectional causation runs from budget deficit to current account deficit, which supports the conventional theory of the positive relationship between fiscal and external deficits, i.e. the twin deficit hypothesis for Nepal. The probable adverse effects that arise from such kind of relationship in the economy should be incorporated by the government of Nepal and concerned stakeholders by adopting appropriate policy measures as well as its effective implementation.

Keywords: *Budget deficit, Current account deficit, Twin deficit hypothesis.*

Introduction

The issue of twin deficit hypothesis emerged during the 1980s when both the budget deficit and current account deficits were increasing in the United States of America (Asrafuzzaman et al., 2013). This phenomenon is related to the open macroeconomic situation of an economy which shows multiple linkages with several variables and may produce substantial effects on the economy. Nowadays, it has been developed as the common feature of most of the developed as well as developing economies.

Theoretically, there are two arguments for the twin deficit hypothesis. One, the Mundell-Fleming framework, argued that an increase in the budget deficit due to the rise in government expenditure leads to an increase in interest rate resulting in higher capital inflows. Hence, the exchange rate appreciates encouraging imports rather than exports which in turn leads to degradation of the current account balance (Mundell, 1963; Fleming, 1962). Another, the Ricardian Equivalence Hypothesis, argued that tax-financed expenditures do not affect private spending or national saving and hence, the current account deficits are independent of the fiscal deficits (Barro, 1989).

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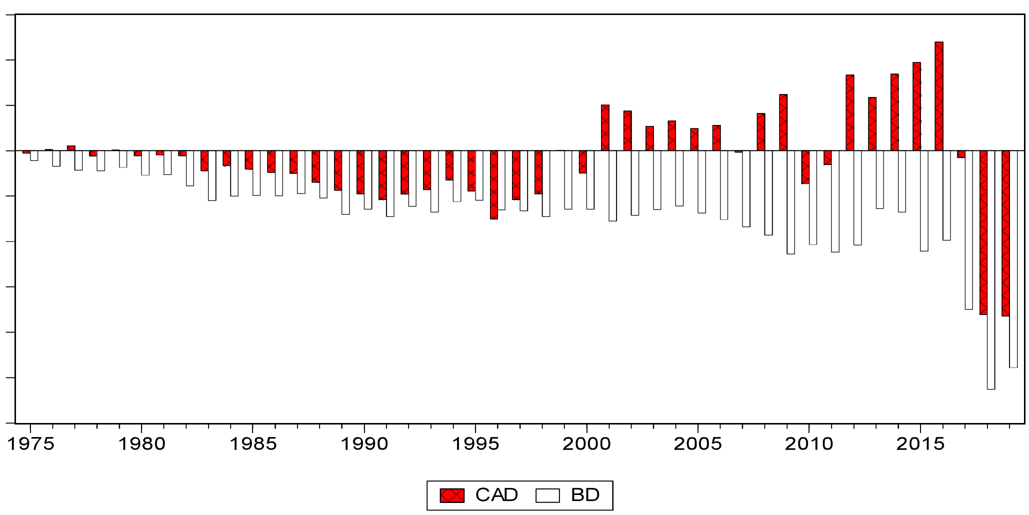
While looking at the various empirical literature on the twin deficit hypothesis, there exists a mixed results. Studies such as Bhat and Sharma (2018), Epaphra (2017), Banday and Aneja (2017), Iyeli and Ovat (2017), Tang (2015), Subedi (2013), Makin and Narayan (2012), Ali (2009), Acharya (2009), Chowdhury and Saleh (2007), Salvatore (2006), Cavallo (2005), Vamvoukas (1999), and Abell (1990) show the evidence to support the Conventional Keynesian view that an increase in the budget deficit increases the current account deficit which is known as twin deficit hypothesis with causality runs from budget deficit to the current account deficit. Similarly, the study conducted by Marinheiro (2008), Magazzino (2012), Amaghionyeodiwe and Akinyemi (2015), Ngakosso (2016), Helmy (2018) found evidence on reverse causality runs from current account deficit to the budget deficit. Also, Islam (1998), Mukhtar et al. (2007), Asrafuzzaman et al. (2013), Shastri et al. (2017) show the evidence on bidirectional causality relationship between budget deficit and the current account deficit. However, several studies such as Kim and Roubini (2008), Nazier and Essam (2012), and El-baz (2014) found evidence on the twin divergence hypothesis that the negative relationship between budget deficit and current account deficit.

An Overview of Twin Deficits for Nepal

Nepal crossed 68 years of budgetary practices and 63 years of planned development history. Similarly, Nepal adopted a series of structural adjustment programs in conjunction with economic liberalization policy during the mid-1980s and became a member of WTO and other regional organizations with the hope of stabilizing the economy both internally and externally (Subedi, 2013; Shrestha, 2010). Despite such various efforts, Nepal has not been able to achieve the desired output yet as expected.

Figure 1: Trend of Twin Deficits for 1975-2019



Source: Current Macroeconomic and Financial Situation-2018/19, Nepal Rastra Bank.

Figure 1 shows the expanding budget and current account deficit until 1998. A sharp improvement has been noticed in the current account in 1999 after 1979. After 2001, it showed a positive trend with fluctuations in some years, but the fiscal balance has been negative continuously. The increasing inflow of overseas remittances and surge in foreign aid could be two of the potential causes of the improvement in the current account balance.

The fluctuations of the external sector balance are attributed to several historical events like the adoption of liberal economic policy in the 1980s, economic sanctions imposed by India in 1989/90, exchange rate volatility, magnitude of oil price hikes, various tariff and non-tariff barriers in foreign trade, and the undeclared blockade by India in 2015 etc. Moreover, the external deficit of Nepal has been increasing year to year due to the underutilization of technology, physical and human resources, inability to produce essential goods and services within the economy, and less diversification of trade in terms of commodities and countries.

However, the excess government spending for the referendum of 1980 against the party-less Panchayat system, adoption of open and liberal macroeconomic policies during the 1980s, restoration of democracy in 1990, the reconstruction activities followed by devastating earthquake of 2015, and adoption of full-fledged federalism in the budget of FY 2017/18 etc. may be the reasons behind the ever-expanding budget deficit that might have led to fluctuations in the current account as well.

Despite the increasing budget deficit, Nepal continues to remain at low risk of debt distress. Similarly, the external deficit is driven by strong import demand and higher oil prices. However, Nepal continues to have adequate reserves to facilitate imports and its external debt is low which is better off than other countries. Investments activities are likely to remain high due to which import is stretching and keep the current account in deficit condition (Ezemenari & Joshi, 2019).

Fiscal and current account balances must be predictable and controllable to make the country's internal and external sectors well-adjusted. Referring to the trend and structure of trade balance and fiscal balance of Nepal, the study on the twin deficit hypothesis is essential to indicate appropriate macroeconomic policies for balanced internal as well as external sectors. In Nepal, there are only few studies relating to the issue of the twin deficit hypothesis. So, the area of research in the field remains. Therefore, this study attempts to examine the association between the budget deficit and current account deficit in Nepal using the ARDL bounds testing approach to co-integration. The results obtained from this study are expected to help concerned stakeholders for controlling the adverse effects of twin deficits in small and developing economies like Nepal.

This study is organized into five sections. Section-1 is the introduction. Section-2 includes the theoretical framework. Section-3 is about data and methodology. Section-4 presents the results and interpretation. Finally, section-5 concludes the study.

Theoretical Framework

Using the national accounting identity for an open economy, a causal relationship can be examined with the following model;

$$Y = C + I + G + (X–M) \ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Equation (1) indicates that the national output/GDP (Y) is the combination of household consumption expenditure (C), gross private investment (I), government expenditure on goods and services (G), and net exports (X-M) in the economy. Equation (1) measures the total output by expenditure on final products (demand side). Similarly, national output/GDP can also be measured by the supply-side as

$$Y = C + S + T \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.. (2)$$

Equation (2) shows that the national output from the supply side is the sum of consumption, private saving, and government tax revenue. Now, equating equations (1) and (2) and rearranging the terms as;

$$(X\text{-}M) = (S\text{-}I) + (T\text{-}G) \ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

In this case, the current account balance (X-M) equals the saving-investment gap (S-I) plus budget balance (T-G), which implies that the current account balance is directly related to the saving-investment gap and the tax-expenditure gap. If (S-I) is stable over time then fluctuations in budget deficit lead to the fluctuation in the current account deficit which supports the twin deficit hypothesis. Again, if (T-G) is fully offset by (S-I), then it brings no effect on the current account deficit which supports the Ricardian Equivalence Hypothesis (Ravinthirakumaran et. al. 2015).

Research Methodology

Data Sources and Variables

Required time-series data sets from 1975 to 2019 are collected from the Nepal Rastra Bank, the central bank of Nepal. The budget deficit (BD) and the current account deficit (CAD) are used as core variables and real GDP as exogenous variable in the study. A budget deficit represents the excess of annual total government expenditure over its revenues in the economy during a particular year. Likewise, the current account deficit is defined as the difference between total exports of goods, services, transfers, and total imports of them during a certain time. Moreover, real gross domestic product is the inflation-adjusted measure of the monetary value of economic output produced at a given time within the economy. The nominal form of the variables is converted into the real term by dividing the value of the GDP deflator at constant prices of the base year 2001.

Model Specification

Based on the theoretical literature and following Nazier and Essam (2012), it can be expressed in the form of equation as;

$$CAD = f(BD, RGDP) \ldots\ldots\ldots\ldots\ldots\ldots (4)$$

The explicit form of equation (4) shows the linear relationship between the dependent and explanatory variables as shown in equation (5),

$$CAD_t=\beta_0+\beta_1 BD_t+\beta_2 RGDP_t+U_t \ldots\ldots\ldots\ldots\ldots (5)$$

Here, β_0 is intercept; β_1 and β_2 are respective coefficients to be estimated, U is the error term and t stands for the time. The coefficient β_1 is expected to have a positive sign as an increase in budget deficit increases the current account deficit. Similarly, the coefficient β_2 is expected to be negative as an increase in domestic income (RGDP) decreases the current account deficit.

ARDL Approach to Co-integration

This study uses the advanced technique of co-integration known as the autoregressive distributed lag (ARDL) model developed by Pesaran and Shin (1999); and Pesaran, Shin, and Smith (2001) which is applicable in time series irrespective of whether the underlying regresses are purely I(0), purely I(1), or mutually integrated. The ARDL approach to co-integration has become popular in recent years as it has numerous advantages in comparison to other co-integration methods such as Engle-Granger (1987), Johansen (1988), and Johansen and Julius (1990) procedures (Shah & Bhusal, 2017). This procedure is a statistically more significant approach to determine the co-integrating relation in small samples. Furthermore, it addresses the problems in the estimation due to the presence of serial correlation between the explanatory variables (Paudel & Acharya, 2020).

The ARDL version of equation (5) could be tested using equation (6) as below:

$$\Delta CAD_t = \beta_0 + \beta_1 CAD_{t-1} + \beta_2 BD_{t-1} + \beta_3 RGDP_{t-1} + \sum_{i=1}^{p} \gamma_i \Delta CAD_{t-i} + \sum_{i=0}^{q} \delta_i \Delta BD_{t-i} + \sum_{i=0}^{r} \theta_i \Delta RGDP_{t-i} + V_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (6)$$

In the model (6), Δ stands for the first-order differential variable. β_0 is intercept, β_1,β_2 and β_3 are the respective long-run coefficients while γ_i, δ_i, and θ_i represents the short-run dynamics and V_t is the vector of random error. The error term must be white noise (independently and identically distributed). A positive coefficient of error term indicates a divergence, while a negative coefficient indicates the convergence towards equilibrium.

The hypotheses for testing the long-run relationship between the variables are:

Null Hypothesis (H_0):β_1=β_2=β_3=0; Co-integration does not exists.

Alternative Hypothesis (H_1) : $\beta_1 \neq \beta_2 \neq \beta_3 \neq 0$; Co-integration exists.

If the result obtained is co-integrated, then there exists a long-term relationship among the variables. For this, F-statistics is compared with the critical values provided by Pesaran, Shin, and Smith (2001). If the computed F-statistics is higher than the appropriate upper bound of the critical values, the null hypothesis of no co-integration is rejected, if it is below the appropriate lower bound, the null hypothesis cannot be rejected, and if it is lies within the lower and upper bounds, the results is inconclusive.

For the diagnostic tests of the model, various formal tests such as Lagrange Multiplier (LM) test for serial correlation, Ramsey Reset test (RESET) for functional form misspecification, Jarque - Bera test for normality, and KB test for heteroscedasticity are carried out. Similarly, for the stability test of the model, CUSUM and CUSUMSQ tests are carried out.

Granger Causality Test

If the variables used in the model are co-integrated, then there exists a relationship between the variables. To determine the pattern of such a relationship, the Granger-Causality test developed by Granger (1969) is employed. Thus, the study uses a simple Pairwise Granger Causality test to check the causal relationship between the government budget deficit and current account balance.

$$CAD_t = \alpha_0 + \sum_{i=1}^{n} \beta_{1i} BD_{t-i} + \sum_{j=1}^{n} \gamma_{1j} CAD_{t-j} + \mu_{1t} \ldots\ldots\ldots\ldots\ldots (7)$$

$$BD_t = \alpha_0 + \sum_{i=1}^{n} \beta_{2i} CAD_{t-i} + \sum_{j=1}^{n} \gamma_{2j} BD_{t-j} + \mu_{2t} \ldots\ldots\ldots\ldots\ldots (8)$$

The first hypothesis for the Granger-causality test:

Null Hypothesis (H_0) : β_{1i}= 0, i.e. BD does not Granger Cause CAD.

Alt.Hypothesis (H_1) : $\beta_{1i} \neq 0$, i.e. BD does Granger Cause CAD.

The second hypothesis for the Granger-causality test:

Null Hypothesis (H_0) : β_{2i}= 0, i.e. BD does not Granger Cause CAD.

Alt.Hypothesis (H_1) : $\beta_{2i} \neq 0$, i.e. BD does Granger Cause CAD.

If H_0=β_{1i}=0 is rejected, it shows that budget deficit Granger causes current account balance, if H_0=β_{2j}=0 is rejected, which means that the current account balance granger causes the budget deficit. Similarly, if both the null hypotheses of equations (7) and (8) are rejected (i.e. β_{1i}=0 & β_{2j}=0), there is bidirectional causality between budget deficit and current account. But if none of the hypotheses are rejected, it means there is no causal relationship between the budget deficit and current account deficit.

Results and Discussion

Unit Root Test Results

To detect the unit root in the series, the ADF statistic (t-stat) is compared with that of critical values for each variable. If the absolute value of the ADF statistic is found greater than that of absolute critical values, then the variable is considered to have no unit root which means the variable is stationary. Likewise, if the p-value is less than 5 percent (p

< 0.05), we reject the null hypothesis of non-stationarity of the variable. If the series is stationary without any differencing, it is said to be integrated of order 0 and denoted by *I*(0). Similarly, if the series is stationary after a first difference is said to be integrated of order 1 and written as *I*(1).

Table 1: Augmented Dickey-Fuller (ADF) Test for Unit Root

Variables		Level		First Difference		Decision
		Intercept	Intercept & Trend	Intercept	Intercept & Trend	
CAD	t-statistic	- 2.829	- 2.6986	- 5.663*	- 5.718*	I(1)
	p-value	0.0725	0.2423	0.0000	0.0001	
BD	t-statistic	0.876	-0.480	- 5.032*	- 4.983*	I(1)
	p-value	0.9941	0.9804	0.0002	0.0013	
RGDP	t-statistic	7.918	2.454	1.331	- 5.188*	I(1)
	p-value	1.0000	1.0000	0.9984	0.0006	

Source: Authors computation.

Note: * denotes the rejection of H_0 at a 1 percent level of significance.

Table 1 shows the results of the ADF unit root test of the variables. We detect all the variables are non-stationary at level with intercept as well as intercept and trend but stationary after first differencing, meaning that all the variables are integrated of order one, that is, *I*(1). Thus, it can further proceed for the ARDL bounds testing approach to co-integration.

Lag Length Selection

The selection of appropriate lag order for the ARDL model is essential to detect the co-integrating relationship among the variables. The optimal lags selected by different criteria based on the VAR lag selection approach are presented in the Table 2.

Table 2: VAR Lag Order Selection Criteria

Endogenous Variables: CAD BD RGDP Exogenous Variable: C Included Observations: 41						
Lag	**Log L**	**LR**	**FPE**	**AIC**	**SBC**	**HQ**
0	-1450.13	NA	1.22e+27	70.8846	71.0100	70.9302
1	-1293.38	282.918	9.08e+23	63.6772	64.1787*	63.8598
2	-1277.57	26.2197*	6.57e+23	63.3450	64.2227	63.6646*
3	-1266.96	16.0443	6.19e+23	63.2665	64.5203	63.7231
4	-1256.3	14.5528	5.93e+23*	63.1858*	64.8157	63.7793

Source: Authors computation.

Note: An asterisk * indicates lag order selected by the criterion; LR: sequential modified LR test statistic (each test at 5% level); FPE: Final prediction error; AIC: Akaike information criterion; SBC: Schwarz Bayesian criterion; HQ: Hann-Quinn information criterion.

Table 2 presents the result of lag order by different criteria and the study chooses lag 1 for each variable in their autoregressive distributed lag structures based on the SBC criterion. SBC criterion is selected as it uses minimum acceptable lag while selecting the lag length and avoids the unnecessary loss of degrees of freedom (Shah & Bhusal, 2017).

Co-integration Results

The computed results of the bound test are presented in Table 3;

Table 3: Bound Test (F-version) Results

Variables	F-statistics	Critical Values			Lag Option
		Percent	I(0)	I(1)	
F(RCAD│RBD, RGDP)	5.74	10 %	3.17	4.14	(1,0,0)
		5 %	3.79	4.85	
		2.5 %	4.41	5.52	
		1 %	5.15	6.36	

Source: Authors computation.

As reported in Table 3, F-statistics lies above the upper bound critical value at a 2.5 percent level of significance which rejects the null hypothesis of no co-integration. Thus, it can be concluded that there is a long-run relationship between the variables used in this study.

ARDL Regression Results and Interpretation

Given the existence of co-integration between current account balances, budget deficit, and real GDP the long-run, and short-run estimates for equation (6) were estimated using the ARDL model.

Table 4: Estimated Long-run Coefficients Using ARDL (1, 0, 0) Approach

ARDL(1,0,0) selected based on Schwarz Bayesian Criterion Dependent Variable is CAD 44 observations used for estimation from 1976 to 2019			
Regressor	**Coefficients**	**Standard Error**	**T-Ratio [Prob.]**
BD	2.272 *	0.345	6.586 [0.000]
RGDP	0.160 *	0.025	6.371 [0.000]
INPT (Constant)	-3171.8	6315.6	-0.502 [0.618]
R^2 = 0.77 | Adj. R^2= 0.75 | DW Stat. = 2.17 | F-Stat. F (3,40) = 46.279 [0.000]			

Source: Authors computation.

Note: An asterisk * shows the coefficients at a 1 percent level of significance.

Table 4 displays the estimates of the long-run coefficient of the variables from the selected model. As expected, the coefficient of BD is positive and statistically significant. Specifically, the long-run coefficient of BD is 2.72, which is significant at a 1 percent level. This, in turn, shows that one unit increase in the budget deficit will increase the current account deficit by 2.72 units in the long run with the assumption that other variables remain constant. Similarly, the coefficient of RGDP is also positive, that is, 0.16, which depicts that one unit increase in real GDP will increase the current account deficit by 0.16 units in the long run by holding other variables constant. This is significant at the one percent level. The reason behind this positive coefficient of RGDP could be the import-based structure of the Nepalese economy. The mechanism is increased GDP leads to an increase in consumption capacity through increased income which increases the demand for goods and services. However, the supply of domestic industries is limited and this leads to an increase in imports which ultimately results in the current account deficit. From these results, it can be concluded that the budget deficit and current account deficit are co-integrated with each other and the budget deficit has positive and significant long-run effects on the current account deficit. This finding is also concurrent with the findings of Subedi (2013).

Table 5: Error Correction Representation from ARDL (1, 0, 0) Model

ARDL (1, 0, 0) selected based on Schwarz Bayesian Criterion The dependent variable is CAD 44 observations used for estimation from 1976 to 2019			
Regressor	**Coefficients**	**Standard Error**	**T-Ratio [Prob.]**
BD	1.370 *	0.194	7.042 [0.000]
RGDP	0.097 *	0.017	5.533 [0.000]
	-0.602 *	0.106	-5.638 [0.000]
R^2 = 0.59 | Adj. R^2= 0.56 | DW Stat. = 2.17 | F-Stat. F (3,40) = 19.51 [0.000]			

Source: Authors computation.

Note: * shows the significance of coefficients at a 1 percent level of significance.

Table 5 shows the error correction representation/short-run dynamics' results of the model. As reported in the table, short-run coefficients show the dynamic adjustment of respective variables, and both the coefficients of BD and RGDP have positive and significant effects on the CAD, but the effect is lesser than that of the long-run model. The short-run coefficient of BD is 1.37 and is significant at a 1 percent level of significance. This shows that a one-unit increase in the budget deficit results in a 1.37 unit increase in the current account deficit in the short run. Similarly, the coefficient of RGDP is 0.097 which depicts that one unit increase in real GDP increases the current account deficit by 0.09 units in the short run. This is also statistically significant at a 1percent level of significance.

The error correction term ECM (t-1) indicates the speed of adjustment resorting to the equilibrium in the dynamic model. Importantly, the error correction coefficient has the expected negative sign and is highly significant as shown by the probability value is zero. Specifically, the estimated value of ECM (t-1) is - 0.602 and is statistically significant at a 1 percent level of significance indicating the disequilibrium that occurred in the previous period is corrected in the present period following short-run shocks at a quicker pace. Hence, it shows that short-run disequilibrium on the system converges to the equilibrium at the speed of 60.2 percent per annum.

Similarly, the value of R-squared is 0.59 which means 59 percent of the total variation in the current account is explained by the government budget deficit as well as RGDP, and the remaining 41 percent is due to error. As compared to the long-run model, the value of R-squared is slightly low, but this does not significantly affect our results since the variables are in a different form. The adjusted R-squared is low due to the selection of a restricted error correction model without a constant term following Pesaran and Shin (1999). Further, the probability of F-statistic having 0.000 shows the short-run model which is also significant.

Table 6: Results of Diagnostic Test of Selected ARDL (1, 0, 0) Output

Diagnostic Tests		
Test Statistics	**LM-Version**	**F-Version**
A: Serial Correlation	CHSQ (1) = 0.52 [0.468]	F(1, 39) = 0.47 [0.496]
B: Functional Form	CHSQ (1) = 4.35 [0.037]	F(1, 39) = 4.28 [0.045]
C: Normality	CHSQ (2) = 3.45 [0.178]	Not applicable
D: Heteroscedasticity	CHSQ (1) = 0.26 [0.869]	F(1, 42) = 0.025 [0.873]

Source: Authors' computation.

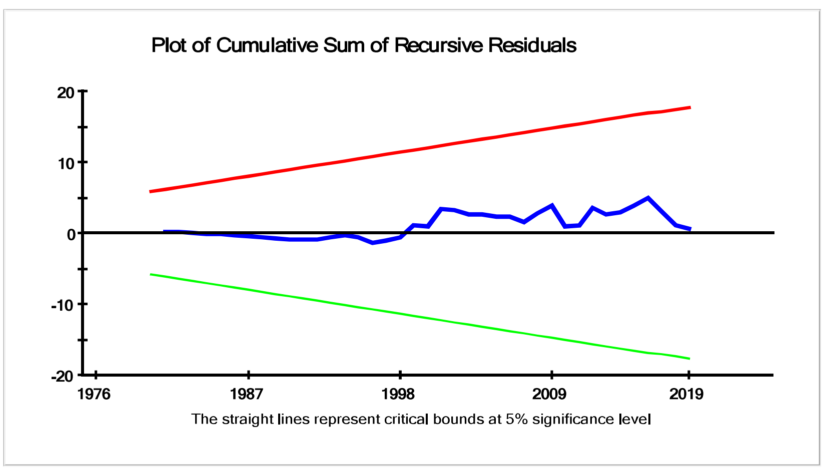
Note: An asterisk * shows the coefficients at 1 percent level of significance; A: Lagrange multiplier test of residual serial correlation; B: Ramsey's RESET test using the square of the fitted values; C: Based on a test of skewness and kurtosis of residuals; D: Based on the regression of squared residuals on squared fitted values.

Table 6 shows the diagnostic tests result of the parameters used in the model that signifies the model passes all of the tests. The null hypothesis of the normality of residuals, the null hypothesis of no first-order serial correlation, and the null hypothesis of no heteroscedasticity are accepted. However, the null hypothesis of no misspecification of functional form cannot be accepted as both LM and F-version exhibits the p-values below the 5 percent level of significance. It might be because the variables that define the current account are missing in the system.

Stability Test

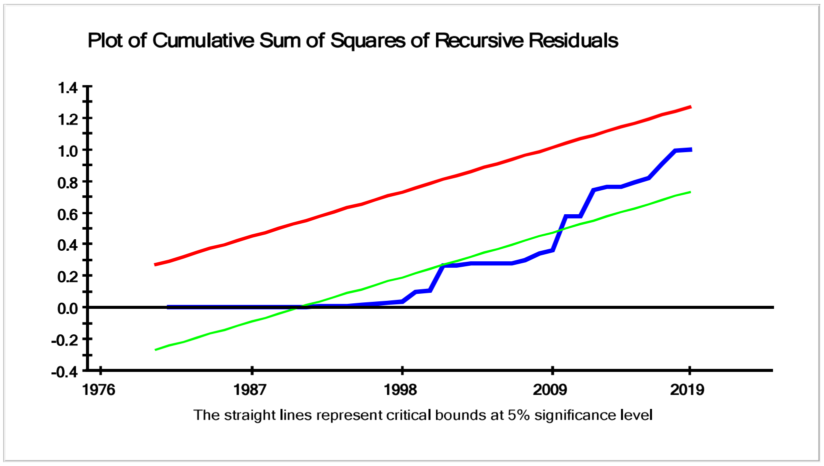
The stability diagnostics examine whether the parameters of the estimated model are stable or not. The CUSUM and the CUSUMSQ tests proposed by Brown, Durbin, and Evans (1975) have been applied to test the stability of the model. The CUSUM test makes use of the cumulative sum of recursive residuals based on the first set of *n* observations and is updated recursively and plotted against breakpoints (Bhatta, 2013). If the plot of CUSUM statistics stays within the critical bounds of 5 percent significance level represented by a pair of straight lines drawn at a 5 percent level of significance, the null hypothesis that all coefficients in the error correction model are stable cannot be rejected. If either of the lines is crossed, the null hypothesis of coefficient constancy can be rejected at the 5 percent level of significance. Also, a similar procedure is used to carry out the CUSUMSQ test which is based on the squared recursive residuals.

Figure 2: Plots of CUSUM statistics



Source: Authors' computation.

Figure 3: Plots of CUSUMSQ statistics



Source: Authors' computation.

Figure 2 presents the plot of the cumulative sum (CUSUM) of the recursive residuals and the result indicates the absence of any instability of coefficients during the study period because the plot lies within the 5 percent critical bounds. Similarly, Figure 3 provides the plot of the cumulative sum of squares (CUSUMSQ) of the recursive residuals. The result indicates the presence of instability in coefficients over a certain period [1989 to 2010] because the plot lies outside the 5 percent critical bounds. It means there is a structural break in the data series used in this study. On the other hand, the plot of the CUSUM statistics provides evidence that the parameters used in the model are stable over the period. However, this fluctuation in squares of recursive residuals is not so worrisome because all coefficients of the parameters estimated are significant even at a one percent level of significance.

Granger Causality Test

Understandably, if the two series are co-integrated, then there will be at least a unidirectional causality relationship between them. This study found the co-integrating relationship between budget deficit and current account deficit, and to determine the causality between the variables, Pairwise Granger-causality has been applied which provides more information about the direction of the causal relationship between such twin deficits.

Table 7: Pairwise Granger-causality between CAD and BD

Pairwise Granger Causality Tests		
Sample: 1975-2019	Lags: 1	
Null Hypothesis:	F-Statistic	Probability
BD does not Granger cause CAD	4.252	0.0456
CAD does not Granger cause BD	3.213	0.0804

Source: Authors computation.

The outcome of the Granger-causality test presented in Table-7 revealed the hypothesis of the budget deficit does not Granger-cause the current account deficit is rejected at standard 5 percent level of significance, which supports the conventional theory of twin deficit hypothesis. At the same time, the null hypothesis that the current account deficit does not Granger-Cause budget deficit cannot be rejected. Hence, it invalidates the reverse hypothesis making causality between the variables.

Conclusion

This empirical study confirms the existence of the twin deficit hypothesis with unidirectional causality running from budget deficit to the current account deficit using time series data sets from Nepal covering the period of 1975-2019 employing the Autoregressive distributed lag approach to co-integration. The result is statistically significant as the ARDL model confirms that one unit increase in budget deficit causes more than a proportionate increment in current account deficit both in the long-run and short-run.

The increasing budget deficit and the current account deficit seem to be serious issues in the Nepalese case. The increasing budget deficit could be because of the growing mismatch between government expenditure and revenue realization. The government expenditure might have been increasing due to increased demand and public expectations over the federal government. Inefficiency and underutilization of resources, the inability of producing essential goods and services domestically, underproduction and less diversification of tradable commodities as well as limited trading partners could be the reasons for lower government revenue. The growing budget deficits ultimately fluctuate the current account balance as well. The growing remittance, foreign investment, loans, and aid could also make an impact on the current account balance in different ways.

Therefore, to keep the current account of Nepal stable, it seems essential to limit the budget deficit at an appropriate level. For this, it is necessary to boost the internal potential as well as external competitiveness of the economy through effective implementation of monetary policy, trade policy, and other aspects of the economy. So, the budget balance as well as current account balance could be kept stable and favorable.

In addition, it should be considered equally the other determinants of the current account such as exchange rate and interest rate etc. through which the external sector could be kept balanced since budget deficit alone cannot explain the current account deficit. It is, therefore, recommended for further research work to check the sensitivity of all transmission mechanisms of the twin deficit hypothesis.

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