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Macroeconomic Effects of Fiscal Deficits on GDP Per Capita of Nepalese Economy

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Abstract

This study investigates the macroeconomic effects of fiscal deficit on Nepalese's GDP per Capita for 2001/02 to 2022/23 while considering inflation rate, interest rate, final consumption expenditure, and gross fixed capital formation as a control variable. The time series analysis was done by collecting data from secondary sources. The ARDL model was employed for the cointegration test; the Granger causality test was performed to check the direct and indirect relationship of the fiscal deficit with the GDP per Capita. The finding reveals that, in the long run, fiscal deficit and GDP per Capita have a positive relationship. Specifically, a 1% increase in the fiscal deficit increases GDP per Capita by $116.57; however, the relationship is statistically insignificant in the short run. The Granger causality test shows that fiscal deficit affects the GDP per Capita directly and through the transmission mechanism. This relationship suggests the role of government in the Nepalese economy, aligning with the Keynes approach. The findings of this research have important implications for the budget formulation process, coordination of fiscal and monetary policy, and further investigation in fiscal management.

Keywords: Fiscal deficit: Inflation, Gross capital formation, Interest rate, Final consumption expenditure, ARDL model

Introduction

There has been a continuous debate among economists on whether the government should interfere in economic activities or not (Sadeh et al., 2021). Classical economists believethat the economy is self-regulated and that for the efficient operations of the economy, there should not be interference from the government (Öner, 2015). However, during 1929, the market forces seemed to have failed; there was low demand, and because of it, there was a low level of production, leading to a low level of employment, and further leading to lower demand; this vicious cycle caused the Great depression situation (Matés-Barco, 2023). The invisible hands failed to get out of this depression, as referred to by the classical economists (Sari-Aksakal, 2024).

John Meynard Keynes challenged the view of classical economists, saying that, in the long run, the economy may be self-regulating. However, in the long run, we all are dead, and we should not wait for automatic adjustment of the market (Eich, 2024). John Meynard Keynes, through his work, 'The General Theory of Employment Interest and Money,' advocates the concept of government interventions in the economy by implementing economic policies to get the economy out of abnormal situations (Hall, 2020). The Government should make expenditures that will generate demand, leading to an increase in production level, higher employment, and higher demand (Baqaee & Farhi, 2020). His idea of government intervention worked to recover the economies from the great depression, and therefore, the formulation of economic policies by the nations was highly adopted worldwide (Bagchi, 2023).

The role of fiscal policy was later challenged by the Neoclassical economist, saying that individuals have access to all the information, and based on that information, they can easily predict the kind of policies the government will introduce. When everyone can easily predict those policies before introducing them, they become ineffective (Reynolds et al., 2020). David Ricardo further supported this through Ricardian equivalence theory, stating that if the government borrows today to finance the fiscal deficit, it has to repay the loan and interest in the future, making people pay larger taxes. Therefore, people will demand less today and save money to pay higher taxes in the

future, which will make the expansionary fiscal policy ineffective (Ikiz, 2020). However, Neo Keynesian economists criticize the classical by saying that expansionary fiscal policies are implemented when the resources are not fully employed in the economy; the expansionary policy will increase the employment level, increasing the economy's aggregate demand (Marto, 2014).

Governments use fiscal policy as a major tool of economic policy for stimulating their economy (Martin et al., 2022). When there is an abnormally higher growth rate, governments spend less than their receipts, known as contractionary fiscal policy, potentially leading to a fiscal surplus. When there is a slow growth rate, governments spend more than their receipts to boost the economy, known as expansionary fiscal policy, potentially leading to a fiscal deficit (Anjum, 2021). The fiscal deficit can be fulfilled either by borrowing (Internal or external) or by printing currencies; both ways of financing the fiscal deficit have their demerits, including higher inflation rate, low level of future capital expenditure, low confidence, sovereign default, crowding out effect, etc. (Catao & Terrones, 2003). However, countries implement fiscal deficits expecting the crowding in effect and the desirable economic growth (Kryeziu & Hoxha, 2021).

Nepal has been implementing its fiscal policy since 2008 B.S. Throughout the subsequent decades, our fiscal policy has been defined by persistent deficits (Acharya, 2021). A country's government revenue base has been lower, and every fiscal policy highly relies on foreign aid and borrowings (Bhattarai, 2013). Continuous borrowing has led to a public debt-to-GDP ratio of 42.7% in 2080 B.S. (Ministry of Finance, 2023).

Nepal has been on the list of least developed countries (LDC) category since the formation of the LDC category. It has been enjoying the facilities and exemptions provided to LDCs (Razzaque, 2020). The LDC category countries were facilitated with interest-free loans or low-interest loans with higher maturity period (up to 50 years including the grace period), exemptions in WTO provisions, priority in grants, etc., to improve broadly three elements, per capita income, human assets index and economic and environmental vulnerability index (Acharya, 2023). In 2015 and 2018, Nepal passed the criteria of the human assets index and economic and environmental

vulnerability index. However, it could not meet the per capita income criteria (National Planning Commission, 2024). In 2021 as well Nepal could not meet the per capita income criteria for upgrading from the LDCs, however, if the country fulfills two criteria out of three for the consecutive two triennial review period, the country is recommended to upgrade from LDC status to developing countries status (National Planning Commission, 2024). In Feb 2021, the United Nations Committee for Development Policy (CDP) recommended, and the United Nations General Assembly approved, the upgradation of Nepal from the LDC category with a preparatory period of 5 years (National Planning Commission, 2024). Nepal has become the only country to get upgraded from the LDC category without fulfilling the per capita income criteria (Acharya, 2023).

In the last five decades, Nepal has been financing its fiscal deficit mainly from borrowing and foreign aid (Ministry of Finance, 2023). The external borrowing costs Nepal an average of only 1.15% due to the LDC status criteria, whereas the internal borrowing costs Nepal an average of 6.14% (Ministry of Finance, 2023). Nepal has not been able to meet the per capita income criteria despite the low interest (interest-free) credit facilities to meet the fiscal deficit from the last five decades; this raises a question of the relationship between fiscal deficit and the GDP per Capita of Nepal.

A fiscal deficit may have multiple effects on the economy; it usually increases the money supply, leading to an increase in the inflation rate and an increase in final consumption expenditure (Dick, 2022). Similarly, domestic borrowing to finance the fiscal deficit may increase interest rates and discourage private investors, decreasing gross fixed capital formation (Sharma & Mittal, 2019). Previous studies have primarily focused on the impact of fiscal deficit on the economic growth rate of Nepal; however, the economic growth rate may be inadequate to explain the role of fiscal deficit as it does not provide the actual picture of the standard of living, individual welfare and sustainable growth of the economy. Further, they were primarily focused on the direct relationship between the fiscal deficit and economic growth rate. This may not be the case, but the fiscal deficit may have a transmission mechanism for economic growth.

The Financial Management expenditure of Nepal has already surpassed the capital expenditure in the budget allocation; the additional borrowing will increase the financial management expenditure and decrease the capital expenditure soon. This is a matter for policymakers to decide whether to continue with a fiscal deficit. To address these critical issues, this study aims to determine the direct impact of fiscal deficit on the economic growth of Nepal as well as the indirect impact of fiscal deficit on economic growth via transmission mechanism through crucial economic indicators such as gross capital formation, inflation rate, interest rates, and final consumption expenditure.

The upcoming sections of this study are structured as follows: Section 2, the literature review, explores existing research on fiscal deficits and their macroeconomic effects, identifying key studies and theoretical frameworks that have informed the field. Section 3, the research methods, outlines the study's design, data sources, variables, and analytical techniques used to investigate the relationships between fiscal deficit and macroeconomic variables in Nepal. Section 4, results and discussion, presents the study's findings, analyzes the data, and interprets the results in the context of both direct and indirect effects of the fiscal deficit on GDP per Capita and other economic indicators. Finally, Section 5, the conclusion, summarizes the key insights, policy implications, and areas for future research.

Literature Review

Nepal has undergone various political changes, including transitions from monarchy to constitutional monarchy to a federal model (Dhungel & Gonzalez, 2023; Ghimire et al., 2024). These changes caused fiscal challenges and affected effective economic governance (Jamil & Paudel, 2023). The continuous fiscal deficit in developing countries like Nepal is mainly due to low revenue generation. Lack of expertise in administrative staff, corruption, underdeveloped resources, and lack of optimal utilization of natural resources are the major causes of low revenue generation (Kitavi, 2023).

Fiscal deficits have different impacts in different economies of the world. The fiscal deficit has a negative impact on the economies of Vietnam, Ghana, and India (Kurantin, 2017; Ramu &

Gayathri, 2017; Thuy Van et al., 2020; Tung, 2018). Ramu & Gayithri (2017) in their study found that in the long run, a 1% increase in fiscal deficit decreases GDP by 0.618609 in India. In the context of Nepal, Gajurel & Dangal (2023) found a short-run negative relationship between fiscal deficit and GDP growth; however, the relationship is not significant in the long run. The impact of fiscal deficit also depends upon the conditionality of the foreign aid and donor loans. Also, higher financial management expenditure decreases the country's development expenditure (Quattri & Fosu, 2012). A similar conclusion was derived from the study of Umor Agundu et al. (2013), who found that fiscal deficits do not lead to desired developmental outcomes.

The negative relationship between fiscal deficit and economic growth is a one-sided aspect. Chowdhury (2004) found that fiscal deficit does not lead to a crowding out effect in the least developed countries, and such fiscal deficit accelerates economic growth. This was further supported by the studies of Navaratnam and Mayandy (2016) and Venkataraman and Urmi (2017), who found a positive relationship between fiscal deficit and economic growth in South Asian countries and India, respectively. It is not always the case that the fiscal deficit directly affects the GDP per Capita of a country. It may follow a transmission mechanism. In their study, Ludvigson (1996) and Ahking & Miller (1985) found that fiscal deficit increases Inflation, adversely affecting economic activities and GDP. The transmission mechanism of fiscal deficit is further supported by the study of Sharma & Mittal (2019), who found that fiscal deficit results in a higher inflation rate, thus causing changes in the interest rate and exchange rate simultaneously and changes in the interest rate and exchange rate influence the GDP.

Irving Fisher, in his quantity theory of money, through his equation MV=PT, explains that when the money supply in an economy increases, keeping another thing constant (V and T), the price level also increases, i.e., increased money supply (M), leads to an increase in the price level, i.e., Inflation (P). This theory was supported by Nguyen (2015) in his study on Asian countries from 1985-2012, which found a positive relationship between Inflation and fiscal deficit. However, in their study, Obinabo & AGU (2019) and (Mathu et al., 2018) found no significant relationship

between Inflation and fiscal deficit in Nigeria and Kenya, respectively.

Another major issue concerning the fiscal deficit is the crowding in and crowding out effect. The crowding out effect is one of the popular concepts in economics, which shows that when the government increases spending through borrowing, it increases the interest rate for the private investors, discouraging them from investing, further leading to a decrease in gross fixed capital formation, while crowding in effect encourages the private investors to increase their investment, leading to an increase in the gross fixed capital formation (Friedman, 1978). The crowding in and out concept has been aligned with studies of Kannan & Singh (2007) and Kirchner & Wijnbergen (2012), which found that fiscal deficit can adversely impact the interest rate. Further, Ramu & Gayithri (2017) suggested that fiscal deficit spent on capital formation promotes economic growth. It was also supported by the work of Amrutha et al. (2017), which suggested that when the fiscal deficit is directed toward productive investments that enhance the economy's capital stock, it can positively affect long-term economic growth. However, another study by Hassan et al. (2014) rejected the concept of crowding effects, explaining there is no significant relationship between fiscal deficit and the interest rate.

Studies in the past have found that fiscal deficit and economic growth are directly connected in various countries worldwide. However, this study expands the scope to include indirect transmission mechanisms through other macroeconomic variables. Furthermore, it employs per Capita GDP as a measure of economic growth, considering the living standard of an average Nepali citizen rather than taking the aggregate GDP used in earlier studies. The research utilizes recent data from 2001/02 to 2022/23, benefiting from improved data collection methods and accuracy.

Research Methods

The selection of the research design of the study depends on four major aspects: research objective, data accessibility, significance of decision, and expenses related to data collection (Zikmund, 2003). Based on those aspects, the inferential research design has been used to answer

the research questions of this study. This study covers data from 2001/02 to 2022/23, obtained from secondary sources, including the Ministry of Finance, the World Bank, Nepal Rastra Bank, and the National Planning Commission. This period is selected due to its relevance, policy implications, and data quality.

The sources of secondary data assortment are exhibited in Table 1

Table 1

Sources of Secondary Data

Symbols	Variable Definition	Data Source
Y	GDP Per Capita ($)	Ministry of Finance, National Planning Commission
X1	Fiscal Deficit (% of GDP)	Ministry of Finance and National Planning Commission.
X2	Inflation % (CPI)	Nepal Rastra Bank and Ministry of Finance
X3	Interest Rate (Annualized Interest rate % of Treasury Bonds)	Nepal Rastra Bank
X4	Final Consumption Expenditure (% of GDP)	Ministry of Finance, Economic Survey
X5	Gross Capital Formation (% of GDP)	Ministry of Finance, National Planning Commission

Descriptive statistics were used to gain insight into the data. To identify the stationarity of the data set, the Augmented Dickey-Fuller unit root test and Phillips-Perron Test were used; to test the autocorrelation, the Durbin Watson test and LM test were used; and to identify whether the variances of the data are non-constant, the heteroscedasticity test was performed. A normality test was performed to check whether the data were normally distributed.

After performing all those tests, the research employed the Auto-Regressive Distributed Lag (ARDL) model, which has several advantages both in terms of statistical inferences and preciseness of estimations over other conventional models of cointegration testing (Panopoulou & Pittis, 2004). It can simultaneously estimate the short-run and long-run relationships (Hundie, 2021). This approach efficiently corrects the endogeneity problem of explanatory variables

(Panopoulou & Pittis, 2004) and solves the issues of autocorrelations and variable omissions (Baloch et al., 2017).

$$\Delta GDP_t = \alpha 0 + \sum\beta_1 \Delta FD_{t-1} + \sum\beta_2 \Delta inflationrate_{t-1} + \sum\beta_3 \Delta Interestrate_{t-1} + \sum\beta_4 \Delta FCE_{t-1} + \sum\beta_5 \Delta NEER_{t-1} + \sum\delta_1 FD_{t-1} + \sum\delta_2 inflationrate_{t-1} + \sum\delta_3 interestrate_{t-1} + \sum\delta_4 FCE_{t-1} + \sum \delta_5 GCF_{t-1} + + \sum\Omega_1 GDP_{t-1} + \mu t$$

The econometric model is specified as shown below:

The above model examines the short- and long-term relationship between GDP per Capita (ΔGDPt) and other variables, fiscal deficit (FD), inflation rate (Inflation), interest rate (Interest), final consumption expenditure (FCE), and gross capital formation (GCF).

The coefficients β1, β2, β3, β4, and β5 represent the short-run impact of changes (Δ) in their respective variables on GDP per Capita, while the coefficients δ1, δ2, δ3, δ4, and δ5 represent the long-term impact of the lagged levels of these variables on GDP per Capita. The coefficient Ω1, associated with lagged GDP (GDPt-1), indicates the speed at which the economy returns to equilibrium after a shock, where a negative value suggests that the economy gradually returns to equilibrium over time. Finally, the error term μt reflects any unexplained variations in GDP per Capita.

The cumulative sum (CUSUM) test has been performed to check the model's stability. Additionally, a Granger Causality Test has been performed to check the unidirectional and bidirectional causality among the variables. The Stata software has been used for data management, exploratory data analysis, and the application of econometric and statistical techniques.

Results and Discussion

Descriptive statistics provide valuable insights into the characteristics and distribution of the variables under investigation.

Table 2

Summary Statistics

Statistics	GDP Per Capita	Budget Deficit (% of GDP)	CPI Inflation (%)	Interest rate	Final Consumption (% of GDP)	GCF (% of GDP)
Mean	780.67	2.52	6.82	4.37	90.75	30.86
Standard Error	81.82	0.70	0.55	0.51	0.62	1.19
Median	814.31	2.83	6.51	4.05	90.76	30.38
Mode	-	-	-	-	-	-
Standard Deviation	383.78	3.31	2.59	2.37	2.92	5.58
Sample Variance	147287.23	10.93	6.69	5.62	8.52	31.12
Range	1144.46	12.66	9.74	8.26	11.66	21.13
Minimum	254.55	-5.17	2.89	0.76	84.70	20.25
Maximum	1399.01	7.49	12.63	9.02	96.36	41.38

During the study period, GDP per Capita increased significantly, rising from $254.55 to $1,399.01, indicating substantial economic growth. The presence of both fiscal surplus and fiscal deficit provided an opportunity to robustly analyze how variations in fiscal policy impact GDP per Capita. Inflation fluctuated between a high of 12.63% and a low of 2.89%, highlighting periods of both high and low Inflation, which could play a crucial role in mediating the relationship between fiscal deficit and economic growth. The mean interest rate of 4.37%, with a range from 0.76% to 9.02%, reflects significant variation in monetary policy, which may help explain how interest rates influence the impact of fiscal deficit on GDP per Capita, particularly through potential crowding-out effects. Additionally, the high mean consumption rate of 90.75% indicates that consumption constitutes a large part of Nepal's GDP, and its relatively low standard deviation (2.92) suggests stable consumption patterns, aiding in isolating the effects of fiscal policy on economic growth. Finally, a mean gross capital formation (GCF) of 30.86%, with a range from 20.25% to 41.38%, indicates significant variability in investment levels, which could be essential for understanding how fiscal deficits affect economic growth through investment channels.

Unit Root Test

The stationary test was performed using Augmented Dickey-Fuller (ADF) to identify whether there exists a unit root. The results show that GDP per capita was stationary at a level while all other variables were stationary at the first difference (See Table 3).

Table 3

Unit Root Test

Variables	Symbols	Stationary Level
Nominal GDP Per Capita (USD)	Y	I (0)
Budget Deficit (% of GDP)	X1	I (1)
CPI Inflation (%)	X2	I (1)
Interest rate	X3	I (1)
Final Consumption (% of GDP)	X4	I (1)
GCF (% of GDP)	X5	I (1)

Normality Test

Similarly, to check whether the residuals follow normality, Shapiro-Wilk tests have been performed. The Shapiro-Wilk test statistic (W) measures how closely the sample data resembles a normal distribution. The range of W is between 0 and 1, where close to 1 indicates the data closely follows a normal distribution. W close to 0 indicates a significant departure from normality.

As Table 4 shows, the W statistic is 0.92099 is close to 1, indicating a good fit to normality.

Table 4

Shapiro-Wilk Test for Normality

Variable	Obs	W	V	Z	Prob>z
Residuals	20	0.92099	1.87	1.262	0.10353

Auto-Correlation Test

This study's autocorrelation test has been checked using the Durbin-Watson value. The Durbin-Watson value is 1.957352, which is close to 2 and shows no presence of autocorrelation.

To ensure its validity, a further Breusch-Godfrey LM test has been performed.

Table 5

Breusch-Godfrey LM Test

Chi2	df	prob>chi
2.962	2	0.2274

The result reflects that the p-value is greater than 0.05, indicating we cannot reject the null hypothesis. Therefore, there is no serial autocorrelation in the model.

Heteroscedasticity Test

A heteroscedasticity test was performed to test the heteroscedasticity problem.

Table 6

White's test for Homoscedasticity

chi2 (19)	20		
Prob>chi	0.3946		
Source	Chi	df	p
Heteroskedasticity	20	19	0.3946
Skewness	8.83	12	0.7175
Kurtosis	2.16	1	0.1413
Total	30.99	32	0.5174

The results show that the p-value of heteroskedasticity is 0.3946, which is greater than 0.05, concluding that there is no problem with heteroscedasticity in this model. From the results of all the tests, it has been found that the ARDL model is most effective for estimating the short-term and long-term effects of the variables.

Cointegration Test

A bounds cointegration test has been performed to test the long-run relationship between the variables. An F-test has been used to test the significance of long-run cointegration between the variables.

Table 7

Bound Test from ARDL

F-statistics	12.773	
Significance bound	I (0) Bound	I (1) Bound
10 Percent	2.26	3.35
5 Percent	2.62	3.79
1 Percent	3.41	4.68

The f statistics value 12.773 is greater than the critical values of 1%, 5%, and 10%, signifying a long-term relationship between the variables.

Short and Long-run Analysis

The error correction model has been applied to test the impact of independent and control variables on Nepal's GDP per Capita.

Table 8

Long Run Estimate

R- Squared	0.9732			
Adjusted R-squared	0.9272			
Root MSE	17.1418			
Variable	Coefficient	Std. Err.	t-stat	Prob.
Budget Deficit (% of GDP)	116.569**	49.15403	2.37	0.049
CPI Inflation (%)	-177.8149**	62.85559	-2.83	0.025
Interest rate	-134.9638*	63.55002	-2.12	0.071
Final Consumption (% of GDP)	162.041**	40.30495	4.02	0.005
GCF (% of GDP)	119.1481**	18.82443	6.33	0.000
C	2584.348*	1273.372	2.03	0.082

The above finding suggests that, in the long run, a one-percentage-point increase in fiscal deficit increases GDP per Capita by $116.57.

The inflation (X2) coefficient is statistically insignificant at 5% (p=0.055). There's a weak indication that higher Inflation might be associated with lower GDP per Capita in the long run.

Interest Rate (X3) coefficient is -134.9638 is insignificant at the 5% level (p=0.071). Again, there's a weak indication that higher interest rates might be associated with lower GDP per Capita. Final Consumption Expenditure (X4) coefficient is 162.041 and significant (p=0.005). This suggests that higher consumption as a % of GDP is strongly associated with higher GDP per Capita in the long run. Gross Capital Formation (X5) coefficient is 115.1481 and highly significant (p=0.000). This indicates that higher investment as a % of GDP is strongly associated with higher GDP per Capita in the long run.

Table 9

Short Run Estimate

Variable	Coefficient	Std. Err.	t-stat	Prob.
D (CPI Inflation (%))	-42.36476**	9.336885	-4.54	0.003
D (Final Consumption (% of GDP))	12.51449	12.51449	2.31	0.054
D (GCF (% of GDP))	11.12551**	11.12551	2.44	0.005
CointEq (-1)	0.1671203	0.11423	1.46	0.187

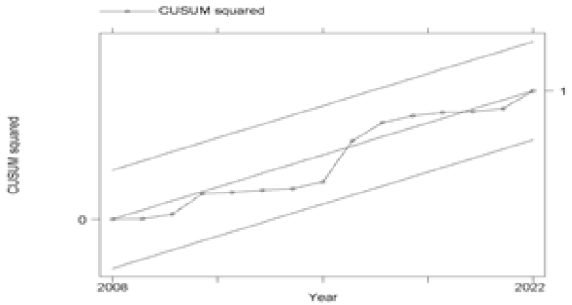
Inflation (X2), both the immediate effect (-42.36476) and lagged effect (-38.62222) are negative and significant. This suggests that in the short run, increases in Inflation negatively impact GDP per Capita. Final Consumption Expenditure (X4) short-run effect (28.91859) is positive but marginally insignificant (p=0.054). Gross Capital Formation (X5) short-run effect (27.15966) is positive and significant (p=0.045), suggesting that increases in investment have an immediate positive impact on GDP per Capita. GDP Per Capita (Y) coefficient (0.1671203) is positive but not statistically significant (p=0.187). This suggests a potential autoregressive component, but it's not strong enough to be conclusive. R-squared (0.9732) and adjusted R-squared (0.9272) indicate that the model explains a large portion of the variation in GDP per Capita, suggesting a good fit.

Stability Test

The CUSUM test has been performed to test the stability of the model.

Figure 1

CUSUM Test



The CUSUM squared line falls within the 0.05 level of significance, and therefore, the model has been concluded to be fit for the study purpose.

Granger Causality Test

The Granger Causality Test was performed to test the transmission mechanism of fiscal deficit on GDP per Capita,

Table 10

Granger Causality Test

Null Hypothesis	Prob.
Budget Deficit does not have a greater causal effect on GDP Per Capita	**0.00**
GDP Per Capita does not have a greater causal effect on Budget Deficit	**0.02**
Inflation does not have a greater causal effect on GDP Per Capita	**0.00**
GDP Per Capita does not have a greater causal effect on Inflation	0.58
Interest rate does not have granger causal effect on GDP Per Capita	0.20
GDP Per Capita does not have a greater causal effect on interest rate	**0.00**
Final Consumption does not have a greater causal effect on GDP Per Capita	**0.02**
GDP Per Capita does not have a greater causal effect on Final Consumption	0.12
Gross Capital Formation does not have a greater causal effect on GDP Per Capita	0.53
GDP Per Capita does not have a greater causal effect on Gross Capital Formation	0.82

Inflation does not have a greater causal effect on Budget Deficit	**0.00**
Budget Deficit does not have a greater causal effect on Inflation	**0.03**
Interest rate does not have granger causal effect on Budget Deficit	**0.01**
Budget Deficit does not have a greater causal effect on interest rate	**0.00**
Final Consumption does not have a greater causal effect on Budget Deficit	**0.00**
Budget Deficit does not have a greater causal effect on Final Consumption	**0.00**
Gross Capital Formation does not have a greater causal effect on Budget Deficit	**0.00**
Budget Deficit does not have a greater causal effect on Gross Capital Formation	**0.00**
The interest rate does not have granger causal effect on Inflation	0.11
Inflation does not have a greater causal effect on interest rate	**0.00**
Final Consumption does not have a greater causal effect on Inflation	0.35
Inflation does not have a greater causal effect on Final Consumption	**0.00**
Gross Capital Formation does not have a greater causal effect on Inflation	**0.04**
Inflation does not have a greater causal effect on Gross Capital Formation	**0.00**
Final Consumption does not have a greater causal effect on Interest rate	**0.00**
Interest rate does not have granger causal effect on Final Consumption	**0.00**
Gross Capital Formation does not have a greater causal effect on Interest rate	**0.00**
Interest rate does not have granger causal effect on Gross Capital Formation	**0.02**
Gross Capital Formation does not have a greater causal effect on Final consumption	**0.00**
Final consumption does not have a greater causal effect on Gross Capital Formation	0.16

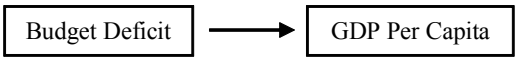
The results of the Granger causality test reveal that the fiscal deficit affects GDP per Capita directly and through the transmission mechanism.

Direct Effect

From this, it can be inferred that a change in budget deficit causes a change in GDP per Capita.

Figure 2

Direct Effect of Budget Deficit on GDP Per Capita

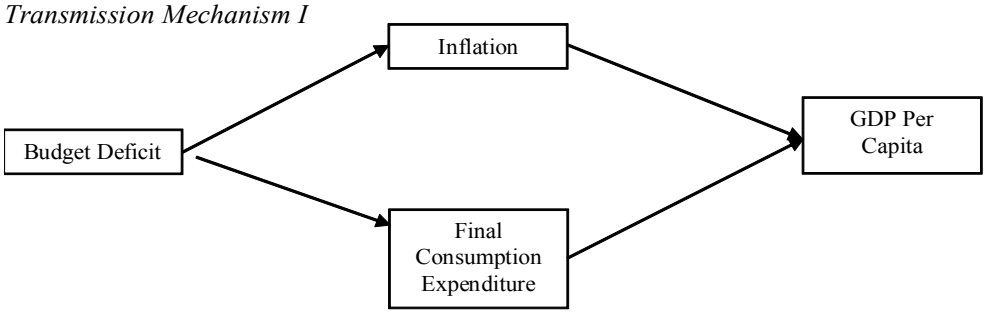


Transmission Mechanism

Budget deficits also cause a change in GDP per Capita through macroeconomic effects. From the Granger causality test, the transmission mechanism can be explained in three ways.

Figure 3

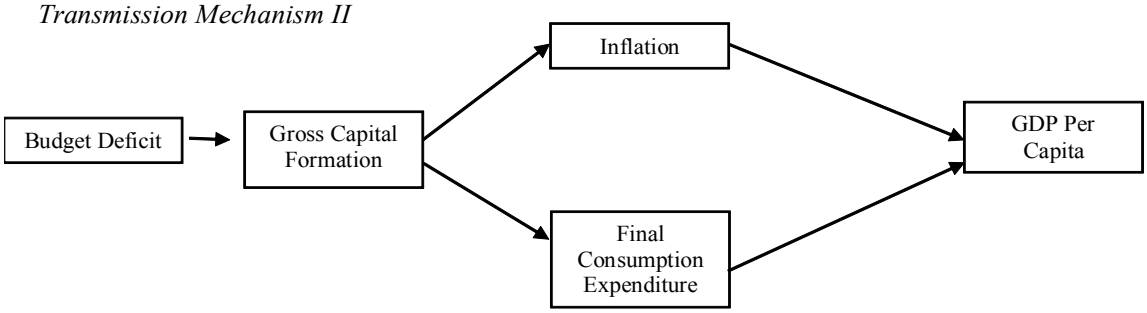
Transmission Mechanism I



The budget deficit causes Inflation and final consumption expenditures, which in turn cause a change in GDP per Capita.

Figure 4

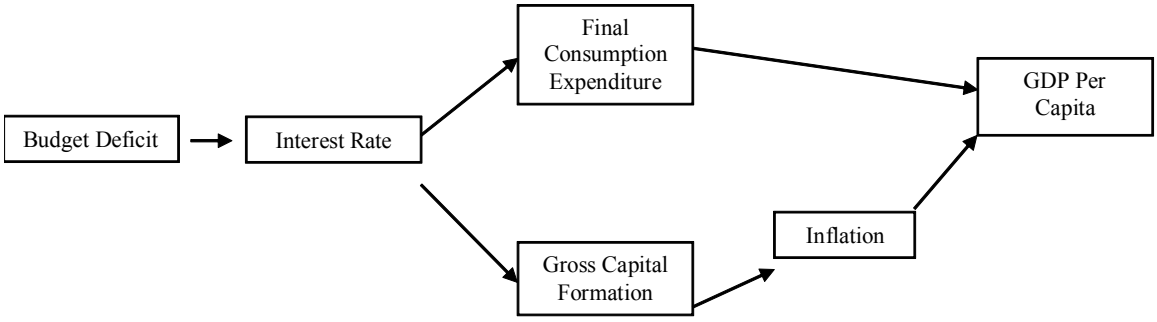
Transmission Mechanism II



A budget deficit causes gross capital formation, which causes inflation and final consumption, and then inflation and final consumption expenditure cause a change in GDP per capita.

Figure 5

Transmission Mechanism III



A budget deficit causes a change in interest rates. A change in interest rate then causes a change in final consumption expenditure and gross capital formation. The change in gross capital formation causes Inflation, which causes a change in GDP per Capita. Also, the change in final consumption causes a change in GDP per Capita.

Table 10

Bidirectional Causality

Bidirectional Causality	Budget Deficit and GDP Per Capita Inflation and Budget Deficit Interest Rate and Budget Deficit Final Consumption and Budget Deficit Gross Capital Formation and Budget Deficit Gross Capital Formation and Inflation Final Consumption and Interest Rate Gross Capital Formation and Interest Rate

From the independent and control variables, only the budget deficit has the bidirectional causality with the GDP per Capita. However, all the control variables have bidirectional causality with the budget deficit.

Conclusion

This research provides empirical evidence for the complex nature of the fiscal deficit's impact on Nepal's economy. The positive long-run relationship between fiscal deficit and GDP per Capita suggests that deficit spending may have stimulative effects on Nepal's economy in the long term, aligning more closely with Keynesian perspectives on fiscal policy effectiveness. The finding of this study contrasts with the results of many studies in other developing economies, such as Tung (2018) in Vietnam and Kurantin (2017) in Ghana, who found negative impacts of fiscal deficits on economic growth. However, the short-run negative impact of Inflation on GDP per Capita focuses on the need for price stability management. This result shows the importance of coordinated fiscal and monetary policies, as suggested by Kannan & Singh (2007) in their study of India's economy.

The bidirectional causality between fiscal deficit and GDP per Capita and the significant relationships with other macroeconomic variables reveals a complex interaction in Nepal's economy. This complexity aligns with the findings of Mohanty (2020) in India, who observed that fiscal deficit impacts economic growth through multiple channels, including investment, interest rates, and government expenditure composition.

These findings also support Hasan's (2020) and Venkataraman & Urmi (2017) arguments regarding the potential benefits of controlled deficit financing in mobilizing resources for development. The positive long-run impacts of both consumption and investment on GDP per Capita suggest that fiscal deficits in Nepal may be effectively channeled into productive economic activities. Significantly, the results for Nepal differ from the general trend observed by Navaratnam & Mayandy (2016) across South Asian countries. While they found negative impacts of fiscal deficits on economic growth in most South Asian countries, they noted that Nepal was the only country where fiscal

deficits positively impacted economic growth. This study provides further evidence of the need for country-specific approaches to fiscal policy.

The findings have several important implications for fiscal and monetary policy in Nepal. Policymakers should consider the potential long-term benefits of deficit spending, particularly when directed toward productive investments. This aligns with the recommendations of Venkataraman & Urmi (2017), who warned against excessive fiscal consolidation at the expense of development financing. However, given the short-run negative impact of Inflation, monetary authorities should closely coordinate with fiscal policymakers to maintain price stability. This supports the concerns raised by Bulíř & Lane (2002) regarding the potential inflationary effects of expansionary fiscal policies.

The positive long-run impact of gross capital formation suggests that policies encouraging investment could complement fiscal measures in promoting economic growth. This finding supports the arguments of Dinh et al. (2010) and Bergoeing et al. (2010) regarding the importance of addressing financial sector constraints and developmental barriers in developing economies. Furthermore, the complex relationships observed between fiscal deficit and other macroeconomic variables highlight the need for a comprehensive approach to economic management. Policymakers should consider the potential impacts of fiscal decisions on interest rates, Inflation, and private sector activity, as suggested by Kirchner & van Wijnbergen (2012) in their analysis of fiscal-financial linkages.

As Nepal approaches graduation from the status of a less developed country, policymakers should carefully consider how changes in access to concessional financing might affect the sustainability and impact of fiscal deficits. This consideration aligns with the concerns raised by Quattri & Fosu (2012) regarding the impacts of aid volatility on fiscal policies in developing countries.

This study opens up several avenues for future research. Firstly, further investigation into the transmission mechanisms between fiscal deficit and economic growth in Nepal is warranted.

This could involve a more detailed analysis of sectoral impacts and the role of specific government expenditure categories in driving growth. Future studies could explore the optimal level of fiscal deficit for maximizing economic growth while maintaining macroeconomic stability in Nepal. This type of analysis could build on the work of Bhatta & Mishra (2020), who identified a public debt threshold for optimal growth maximization in Nepal.

Comparative analysis with other developing economies, particularly those transitioning from least developed country status, could provide additional insights into the role of country-specific factors in determining fiscal policy effectiveness. Such research could help explain why Nepal's experience with fiscal deficits appears to differ from that of many other developing countries. Given the bidirectional causality observed between fiscal deficit and GDP per Capita, future research could employ more advanced econometric techniques to solve the complex dynamics between fiscal policy and economic growth in Nepal.

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Conflict of Interest

I declare that there are no potential conflicts of interest. This study was conducted independently, with no external influences that could compromise the objectivity or integrity of the research findings. Data will be available upon a reasonable request.

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