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Government Expenditure and Economic Growth of Nepal

Santosh Kunwar¹Sunil Nepal²

Abstract

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Purpose: This study aims to analyze the relationship between various categories of government expenditure and economic growth in Nepal. The purpose is to understand how these defense, health, agriculture and education expenditures influence economic performance and offer insights for more effective resource allocation.

Methods: This research used a combination of descriptive and causal research designs, using secondary data sourced from published reports. Data from 1976 to 2022 AD were selected for its comprehensive data availability and analyzed.

Results: The findings reveal that defense expenditure has a negative and significant association with economic growth, suggesting that high levels of defense spending are detrimental to economic development. Conversely, health and education expenditures show positive and significant relationships with economic growth, highlighting the importance of investing in human capital for fostering sustainable development. Agriculture expenditure, although positively related to economic growth, is statistically insignificant, indicating the need for policy refinements to enhance its impact.

Conclusion: The study underscores the necessity for strategic reallocation of government resources. Reducing defense expenditures and increasing investments in health, education and agriculture are essential for promoting robust and sustainable economic growth.

Keywords: ARDL, bound test, economic growth, government expenditure

I. Introduction

Nepal, a developing nation characterized by a diverse economy, faces significant challenges in its pursuit of sustainable economic growth. With an increasing focus on enhancing public welfare, the government has allocated substantial resources to various sectors, including defense, health, agriculture, and education. Understanding how these expenditures impact economic growth is crucial for effective policy formulation and resource allocation.

Despite the considerable investment in these sectors, empirical evidence on their effects on

¹Santosh Kunwar is an MBA-BF Graduate from Lumbini Banijya Campus. He can be reached at insantoshkwr40@gmail.com.

²Sunil Nepal is an MBA-BF Graduate from Lumbini Banijya Campus. He can be reached at sunil9857060142@gmail.com

Nepal's economic growth remains sparse. Previous studies have concentrated primarily on the overall relationship between government spending and growth, often neglecting the specific contributions of different expenditure categories. This gap in the literature necessitates a closer examination of how distinct types of government expenditure influence Nepal's economic performance.

Government spending is a significant predictor of economic expansion. Nevertheless, the scale, investment capability, and optimal utilization of capital investment in the growing phase all influence economic growth. Capital investment in Nepal has been unable to affect the economy's growth or growth because of political insecurity, internal incapacity, and an inadequate leadership condition (Sharma, 2012).

Keynesians state that policymakers can use government spending to fix short-term cyclical changes in aggregate spending and maintain a healthy level of economic activity (Singh & Sahni, 2014). Oppositely, the Traditional View fights that extreme government contribution in financial undertakings adversely affects growth execution for two reasons: first, the overall productivity of the economic system is lowered as a result of government operations frequently being carried out less effectively; furthermore, second, in light of the fact that extreme government spending misshapes monetary impetuses and prompts monetarily horrible choices (Barro, 2012).

Smith (1776) believe that the government interference causes more harm than benefit for an economic therefore private companies ought to carry out a great deal of a nation's activities. Later, Keynes (1936) contradicted traditional economists' views and advocated for increased government spending to stimulate economic development. According to Keynesians, public spending stimulates economic activity and serves as a mechanism to moderate short-run variations in overall spending.

A variety of studies on government spending and economic growth have been undertaken in Nepal. Sharma and Ranjan (2008) and Cooray (2009) came to the conclusion that greater spending by the government helps economic activity to grow. According to Sharma (2012), government spending has a positive influence on economic growth. However, other authors did not agree and simply stated that the bigger public expenditures, the less efficient the overall structure and purpose on the economy would be. They disputed that government expenditure cause's economic growth. Henrekson (2015) discovered a large but inverse link between government spending and economic growth. Thus, current study must be conducted in the current context to address the following issue about Nepal's government expenditure and macroeconomic activity.

Nepal, like many developing countries, allocates a significant portion of its budget to defense, health, agriculture and education. However, the effectiveness of these expenditures in driving economic growth remains a subject of debate. Understanding how these different types of spending influence economic performance is essential for optimizing resource allocation and promoting sustainable development. Despite substantial investments in these areas, Nepal has faced challenges in achieving consistent economic growth. This study aims to address the following questions: How do defense, health, agriculture and education expenditures impact economic growth in Nepal? Are there discrepancies between expected and actual outcomes of these expenditures? And how can policy adjustments improve the effectiveness of government spending?

Taking all of these factors in mind, the present research attempts to analyze the influence of government spending on economic growth in Nepal. The goal of this study was to determine the causal relationship between government spending and GDP.

II. Reviews

Theoretical Concept

Classical economists such as Smith (1776) and Ricardo (1821) believed that countries with more government spending would have weaker economic growth. Government spending is not a key driver in traditional economic theory. The free market economy, as it is commonly known, requires minimal to no government interference. Classical economists believed in the economic miracle of the unnoticed hand or unrestricted markets.

As indicated by Solow (2010) long term financial growth is generally subject to populace growth and specialized progression. At the point when there is less innovative progression, Solow and Swan fight that the main technique to help growth is through the gathering of capital (Agénor, 2021). Government spending overall and government strategies specifically no affect growth. Human resources, in any case, is an urgent growth contribution to the extended Solow model (Mankiw et al., 1992).

Keynes (1936) established his notion about government expenditure and questioned the classical perspective on laissez faire for putting too much attention on the long term. Keynes advocated for increased government expenditure to stimulate economic development. Long-run economic growth, characterized by the percentage of production per person, is dictated by the percentage of productivity of all factors, which is determined by the pace of technical growth (King & Rebelo 1990). Government policies based on endogenous growth model may impact both human capital growth and technical advancement. Several main issues occur when determining whether the historical data supports the neoclassical or endogenous growth models (Bleaney et al., 2000).

Musgrave, an economist, and Rostow, an economic historian, proposed a growth model based on the reasons of increase in government spending and maintained that government spending is a necessity for economic progress. As the economy grows, the balance of government investment shifts toward human capital growth, with higher spending on education, health, and welfare services (Taiwo & Taiwo, 2011).

Empirical Review

Table 1

Meta Table

Author and Date	Variables	Methods	Results
Dritsakis and adanopolous (2004)	Health care, education and culture	Adf, Cointegration, ECM	The education and healthcare sectors have a favorable and considerable impact on economic growth.
Mercan and sezer (2014)	Health expenditure	ADF, Cointegration, ARDL, ECM	Education expenditure has positive significant on economic growth.
Shahril and hamzah (2011)	Transport, government utilities and health expenditure	ADF, Johanson cointegration	Health expenditure has positive significant effect on economic growth.
Divine (2018)	Education expenditure	FMOLS, PVECM	Education expenditures have a positive effect on economic growth.
Raza et al. (2012)	Agriculture expenditure	Unit root test, ARDL	Agriculture expenditures have positive effects on economic growth.

Anwar et al.(2015)	Agriculture expenditures	Ordinary least square	Agriculture has positive effects on economic growth.
Idoko and jatto (2018)	Government expenditure on agriculture	Multiple regression analysis and Johanson, co-integration test	Government expenditure on agriculture has positive and significant on economic growth.
Omotayo et al. (2019)	Agriculture expenditure and health expenditure	ARDL and ECM	Agriculture expenditure and health expenditure has positive and negative significant on economic growth respectively.
Mapfumo et al. (2012)	Government expenditure on agriculture	Regression analysis model	Government expenditure on agriculture has positive significant on economic growth.
Poudel(2023)	Defense expenditure and Export	Co-integration Test	Defense expenditure in Nepal has a positive short-term impact but has no long-term impact on economic growth.
Muhammad (2020)	Defense expenditure and Economic Growth	Panel autoregressive distributed lag (ARDL)	This study found a clear negative effect of military spending on economic growth.
Donatas (2020)	Defense expenditure and Economic Growth	Regression analysis model	Defense spending and economic growth as they indicate positive relationship with economic growth.
Paula et al. (2021)	Defence spending and economic growth in NATO's countries.	Arellano-Bond dynamic panel data model	This study found a negative effect of military spending on economic growth of NATO's countries.

Khasawneh et al. (2012) identified a relationship between governmental expenditure and higher economic growth rates in Jordan between 2004 and 2011. They used the ARDL method to explain the relationship among GDP growth and monetary policies. Following the analysis, a research concluded that there is a positive relationship between GDP and government spending was observed.

Sharma (2012) studied the link between government expenditure and economic growth in 14 nations from 1990 to 2010, using the cross-sectional approach and data collected over time, it was revealed that government spending had a positive influence on the growth of the economy. Erkin (2020) proposed an innovative approach for examining the correlation between expenditures by governments and growth in the economy in New Zealand. This evidence suggests that increasing government spending stimulates business investment, which accelerates GDP growth instead of reducing consumption.

Sharma (2012) examined the impact of government expenditure and GDP of Nepal. The study is based on the Keynesian and endogenous models. The study employed least square approach to determine the association between government spending and economic growth. The research's main outcome is that the ratio of growth expenditure over total expenditure is growing as time progresses and that there is an extremely weak association between expenditure by the government and economic growth in Nepal.

Suanin (2015) attempted to investigate the effect of government use and financial growth in Thailand. The concentrate exactly inspected the impacts of various sorts of government use in financial growth in Thailand. The finding of the review demonstrated that while monetary consumption has the possibility to advance monetary growth in lengthy run, extra-monetary use as well as semi financial spending can likewise animate short-run monetary growth.

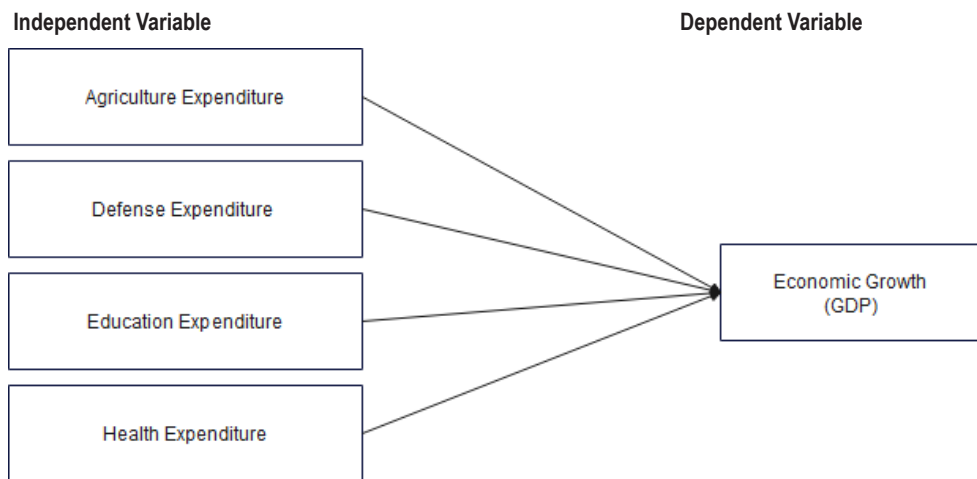
Kharel and Adhikari (2021) examined the relationship between Nepal's government spending and economic growth from 1990 to 2019. During the study period, Nepal's government spending increased dramatically. The result shows a favorable relation between the dependent and independent variables. Rana (2021) examined the effects of ongoing and capital expenditures on Nepal's economic growth during a 45-year period, from mid-July 1975 to 2019. The existence of the long-run and short-run correlations between the variables is examined using the autoregressive distributed lag (ARDL) model.

Dangal and Gajurel (2021) aimed to assess the patterns of governmental spending and to demonstrate how they relate to Nepal's economic growth. The results of the study showed that dependent variables and predictor variables are positively correlated. Regression analysis results further supported the existence of a beneficial association between public spending and Nepal's economic expansion. HE and TCE in particular have a negative association with RGDP.

Rana (2021) examined the effects of ongoing and capital expenditures on Nepal's economic growth during a 45-year period, from mid-July 1975 to 2019. The existence of the long-run and short-run correlations between the variables is examined using the autoregressive distributed lag (ARDL) model. The empirical findings demonstrate that both recurrent and capital expenditures are positively correlated with output growth in both the long- and short-terms and are co-integrated with economic growth.

Research Framework

Figure 1
Research Framework



Note. Adopted from Dangal and Gajurel (2021); Adhikari (2017); Poudel (2023)

Operational Definitions of Variables

Agriculture Expenditure

Investments in agriculture can stimulate rural development and economic growth. Fan et al. (2021) demonstrate that targeted agricultural spending enhances productivity and food security, which can drive broader economic development. Despite these benefits, Nin-Pratt and McBride (2022) argue that the impact of agricultural expenditure is often limited by suboptimal allocation and implementation practices. They emphasize that without strategic planning, agricultural investments may not achieve their full potential.

Defense Expenditure

Defense spending can stimulate certain economic sectors through procurement and infrastructure development. Bleaney and Greenaway (2023) find that defense expenditures can have short-term positive effects on growth by boosting aggregate demand and creating jobs. However, Devarajan, Swaroop, and Zou (2022) argue that excessive defense spending may crowd out investments in other critical areas, leading to slower long-term economic growth. They highlight that high defense budgets often result in less spending on education and health, which are crucial for sustainable development.

Education Expenditure

Education spending is widely recognized for its positive impact on economic growth by enhancing human capital. Hanushek and Woessmann (2020) highlight that investments in education lead to higher economic growth through improved cognitive skills and labor market outcomes. However, Duflo and Kremer (2022) argue that simply increasing education expenditure is insufficient without concurrent improvements in educational quality and system efficiency. They emphasize that the effectiveness of education spending hinges on systemic reforms.

Health Expenditure

Health investment improves productivity and economic outcomes. Cohen and Einav (2021) show that increased health spending enhances labor productivity and reduces absenteeism, contributing to economic growth. Nonetheless, Vujicic et al. (2023) suggest that the effectiveness of health expenditures is contingent on the quality of health care systems and policy implementation. Inefficiencies in health spending may limit its positive impact on economic growth.

Hypotheses

The primary goal of the research was to estimate the influence of government spending on economic growth, which was constructed by reviewing several literatures;

- H₁: There is significant effect of agriculture expenditure on economic growth of Nepal.
- H₂: There is significant effect of defense expenditure on economic growth of Nepal.
- H₃: There is significant effect of health expenditure on economic growth of Nepal.
- H₄: There is significant effect of education expenditure on economic growth of Nepal.

III. Methodology

This study is based on a published secondary sources of data and information. This study mainly uses descriptive and causal research design. Descriptive research is used to describe the characteristics of a population, while analytical research is used to test hypotheses and make inferences about relationships between variables. This analysis is based on the time series data of 47 years covering the period of 1976 to 2022. Rational of choosing this period is mainly availability of data. The secondary details and information were acquired from the following sources: economic survey and government financial statistics 1976 to 2015, and economic survey of Nepal 2016 to 2022. Descriptive Statistics, Inferential Statistics, Econometric Modeling and Time-series analysis have been used to draw inferences from the collected information. The general model that depicts the link between government spending and GDP growth may be expressed as follows:

$$RGDP_t = \alpha + \beta_1 AE_t + \beta_2 DE_t + \beta_3 EE_t + \beta_4 HE_t + \epsilon_t \dots \dots \dots (1)$$

Where;

GDP_t = Real Gross Domestic Product

AE_t = Agriculture Expenditure

DE_t = Defense Expenditure

EE_t = Education Expenditure

HE_t = Health Expenditure

IV. Results and Discussion

Descriptive statistics

The descriptive design is adopted for fact finding and gathering adequate information about the external factor affecting economic growth.

According to the Jarque Bera test the value Jarque-Bera is less than probability, our data is not normally distributed. But according to Central Limit Theorem (Kim, 2015), when the numbers of observations are more than thirty, we can conclude that our date is normally distributed.

Table 2

Descriptive Statistics

	GDP	AE	DE	EE	HE
Mean	4.323512	1657.243	1363.265	3520.262	869.8957
Median	4.624000	229.2100	348.2100	932.8500	345.1500
Maximum	9.681275	6754.000	5491.620	14654.51	3931.240
Minimum	-2.977901	16.11000	16.23000	25.35000	12.51000
Std. Dev.	2.645176	2456.424	1783.120	4814.070	1090.054
Skewness	-0.799541	1.164256	1.243714	1.297954	1.220542
Kurtosis	4.258794	2.535718	3.086413	3.210096	3.286437
Jarque-Bera	8.110688	11.04016	12.13142	13.28314	11.83017
Probability	0.017330	0.004006	0.002321	0.001305	0.002698
Observations	47	47	47	47	47

Note. Output of E-views 13

Unit Root Test

Table 3

Augmented Dickey Fuller (ADF) Test to Test Integration Order

Variable	ADF (Constant)		ADF (Constant & Trend)		Remarks
	At level	At First difference	At level	At First difference	
<i>RGDP</i>	0.0008	0.0000	0.0045	0.0000	I(0)
<i>HE</i>	0.0054	0.2525	0.0084	0.7183	I(0)
<i>EE</i>	0.9984	0.0255	0.9678	0.0088	I(1)
<i>AE</i>	0.9976	0.0000	0.9426	0.0000	I(1)
<i>DE</i>	1.0000	0.0000	0.9853	0.0000	I(1)

Note. Output of E-views 13

It is concluded that GDP and HE are stationary at level whereas EE, AE and DE are found stationary at first difference. The mixture of I (0) and I (1) suggest the use of ARDL model.

Test of Correlation Coefficient

The ARDL model does not require multicollinearity test because there is different level of data in the use of the model (Farray & Glauber, 1967).

VAR Analysis

Table 4

VAR for Optimal Lag Structure

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1468.069	NA	3.92e+23	68.51484	68.71963	68.59036
1	-1284.588	315.7585	2.49e+20	61.14362	62.37236	61.59674
2	-1249.806	51.76751	1.66e+20	60.68867	62.94137	61.51940
3	-1192.483	71.98759	4.20e+19	59.18526	62.46191	60.39359
4	-1109.460	84.95389*	3.69e+18*	56.48651*	60.78711*	58.07244*

Note. Output of E-views 13

The optimal lag structure is the one that minimizes the prediction error and has the lowest AIC, SC, and HQ values. Looking at the table, we can see that the optimal lag structure is lag 4.

Autoregressive Distributed Lag (ARDL) Model to Co-integration

Table 4

F-bound Test

Level of significance	F-statistic	Lower bound	Upper bound
10%	15.4827610	3.03	4.06
5%		3.47	4.57
2.5%		3.89	5.07
1%		4.4	5.72

Note. Output of E-views 13

The estimated F-statistics is 15.4827610, which is more than both the lower and upper bound values at all levels of significance. If the estimated F-statistic exceeds the upper bound of the F-distribution, the null hypothesis of no long-run association among the variables is rejected and the alternative hypothesis of a long-run relationship is accepted. This confirms there exist long run relationship among the variables.

Table 6

Result of long-run Estimate for ARDL (2, 1, 1, 2, 3)

Variable *	Coefficient	Std. Error	t-Statistic	Prob.
AE	0.000543	0.000495	2.139265	0.2822
DE	-0.003249	1.763348	-0.988140	0.0884
EE	-0.000307	0.364300	-0.609572	0.7183
HE	0.003189	2.227064	0.604657	0.0339

Note. Output of E-views 13

The study examined Nepal's government expenditure and economic growth using time series data from 1976 to 2022. Based on the findings, it was found that increases in health and education spending have a positive significant influence on GDP growth at the 5% level of significance. The analysis yields a coefficient for health expenditure is 0.010079 ($p < 0.05$). This suggests that a 1% increase in health spending is associated with a 0.010079% increase in GDP growth. For instance, if health expenditure increases by 10% from an average of NPR 50 billion, GDP growth would increase by approximately 0.10 percentage points. Similarly, the coefficient for education expenditure is 0.006263 ($p < 0.05$). This means that a 1% increase in education spending correlates with a 0.006263% increase in GDP growth. For example, a 10% increase in education spending from an average of NPR 70 billion would result in a 0.06 percentage point increase in GDP growth.

Similarly, at the five percent threshold of significance, increases in defense spending have a negative and statistically significant impact on the growth of the economy. The econometric analysis shows that the coefficient for defense expenditure is -0.012993 ($p < 0.05$). This indicates that a 1% increase in defense spending is associated with a 0.012993% decrease in GDP growth. For example, if defense expenditure increases by 10% from an average level of NPR 100 billion, the GDP growth rate would decrease by approximately 0.13 percentage points.

Agriculture expenditure has a positive insignificant influence on GDP growth at the 5%

threshold of significance. This implies that agricultural expenditure had a negative influence on economic growth throughout the time period studied. The coefficient for agriculture expenditure is 0.002064 ($p > 0.05$). This indicates that a 1% increase in agriculture spending is associated with a 0.002064% increase in GDP growth. For example, a 10% increase in agriculture spending from an average of NPR 20 billion would result in a potential increase of about 0.02 percentage points in GDP growth. However, this effect is not statistically significant, suggesting that the impact of agriculture spending on economic growth is not robust.

Table 7

Error Correction Model Representation for the Selected ARDL Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CointEq(-1)*	-1.829581	0.194933	-9.385709	0.0000
D(RGDP(-1))	0.444621	0.125686	3.537558	0.0014
D(AE)	-0.001071	0.000822	-1.303026	0.2028
D(DE)	-0.012993	0.002893	-4.490356	0.0001
D(EE)	0.006263	0.001826	3.430175	0.0018
D(HE)	-0.002271	0.000968	-2.346792	0.0260
R-squared	0.815049	Adjusted R-squared	0.759004	
F-statistic	14.54260	Durbin-Watson stat	2.169611	
Prob(F-statistic)	0.000000			

Note. Output of E-views 13

The COINTEQ coefficient, which represents the lagged error correction term, is important because it is statistically significant and has the correct negative sign. A negative sign indicates that any discrepancy from the long-run equilibrium is corrected by moving back towards it. The magnitude of the coefficient shows the speed of adjustment, with a larger coefficient implying a quicker adjustment towards the long-run equilibrium. Therefore, a higher absolute value of this coefficient suggests that the system adjusts more rapidly towards the long-run equilibrium.

Diagnostic Tests

By performing diagnostic tests, we can ensure the validity and reliability of our statistical inferences and draw appropriate conclusions from the data.

Serial Correlation Test

Table 8

Serial Correlation Test Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.005879	Prob. F(2,33)	0.4231
Obs*R-squared	6.099699	Prob. Chi-Square(2)	0.1918

Note. Output of E-views 13

The table 8 depicts the F-statistic value is 1.005879 with a corresponding p-value (Prob. F(2,33)) of 0.4231, indicating that there is no significant serial correlation at conventional

significance levels (e.g., 5%). This is because the p-value is greater than 0.05, suggesting that we fail to reject the null hypothesis of no serial correlation.

Heteroskedasticity Test

Table 9

Heteroskedasticity Test: Breush-Pagan-Godfrey

F-statistic	1.401738	Prob. F(9,35)	0.2143
Obs*R-squared	17.75800	Prob. Chi-Square(9)	0.2180
Scaled explained SS	16.27836	Prob. Chi-Square(9)	0.2967

Note. Output of E-views 13

The above table 9 shows that the F-statistic is 1.401738, with a p-value (Prob. F(9,35)) of 0.2143. This suggests that we fail to reject the null hypothesis of homoskedasticity (constant variance) because the p-value is greater than 0.05.

Ramsey RESET Test

Table 10

Ramsey RESET Test

	Value	df	Probability
t-statistic	0.976830	28	0.3370
F-statistic	0.954197	(1, 28)	0.3370
Likelihood ratio	1.474470	1	0.2246

Note. Output of E-views 13

The t-statistic is 0.976830 as shown in table 10, with a corresponding p-value (Probability) of 0.3370. Since the p-value is greater than 0.05, we fail to reject the null hypothesis, which suggests that the model is correctly specified and there are no significant functional form errors. The F-statistic is 0.954197, with a similar p-value (0.3370), reinforcing the same conclusion. A higher p-value (greater than 0.05) indicates no evidence of misspecification in the model.

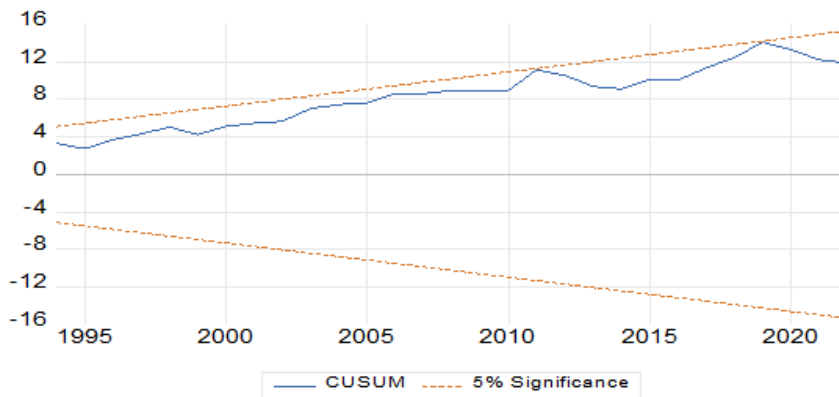
Stability Test

In the figure 2, the CUSUM line stays within the 5% significance boundaries throughout the period. This suggests that the model is structurally stable over time and there are no significant shifts or changes in the parameters of the model.

The model performs well based on all the diagnostic tests. There is no significant serial correlation, no heteroskedasticity, no evidence of model misspecification, and the model is structurally stable over time. These results suggest that the model is robust and reliable for analyzing the underlying data.

Figure 2

Cumulative Sum of Recursive Residuals (GDP)



V. Conclusion and Implication

In conclusion, this research underscores the critical impact of health and education expenditures in fostering robust economic growth, as evidenced by their positive and significant relationship. Defense expenditures exhibit a negative and significant association, suggesting the need for a strategic reassessment in resource allocation. Agriculture expenditures show a positive relationship, it is deemed statistically insignificant, which indicates the importance of refinement of policies to maximize its impact. As a result, these findings advocate for informed policy decisions to prioritize investments in health and education while carefully scrutinizing defense allocations for a more sustainable and prosperous economic future. Health expenditure should be high to increase GDP. Investing in healthcare can lead to a healthier population, reducing absenteeism due to illness and enhancing overall productivity. Healthy individuals are more likely to contribute effectively to the economy by being active in the workforce. Education expenditure is generally considered beneficial for long-term economic growth due to its potential to enhance human capital and innovation, the direct and immediate impact on GDP growth can be influenced by various factors. Quality of education, efficient utilization of resources, and the broader economic environment are crucial aspects that determine the effectiveness of education spending in contributing to GDP growth. Increased spending in the agricultural sector can have positive effects on economic growth, especially in economies where agriculture plays a significant role. Investments in agricultural research, infrastructure, technology, and farmer support programs can lead to increased agricultural productivity, higher crop yields, and rural growth. Defense spending can stimulate economic activity through government contracts, job creation in defense-related industries, and technological advancements. In some instances, defense-related research and growth can spill over into civilian sectors, fostering innovation and economic growth.

Future research should examine the effects of different sub-sectors within health, education and agriculture expenditures. Understanding which specific areas of spending have the most significant impact can guide more targeted policy interventions. Investigate the efficiency and effectiveness of various government expenditure programs. Researchers should focus on how well these expenditures are managed and how they translate into economic growth outcomes. Conduct comparative studies with other countries to understand how different expenditure categories impact economic growth in varying economic contexts. This can provide valuable insights for tailoring policies to Nepal's unique economic environment. Also examine how changes in government spending policies affect economic growth over time.

Researchers should analyze the impact of specific policy shifts can provide evidence-based recommendations for future expenditure adjustments.

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