

Government Expenditure and Economic Growth in Nepal: Sectoral Analysis Using the Vector Error Correlation Model Approach

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Abstract: *The study examines how government spending affects Nepal's economic growth through its two main components: social services and economic development. The research uses historical data that covers the period from 1974/75 to 2022/23. It used time-series econometric methods to study how government spending impacts economic growth, including Unit Root, Johansen Cointegration, Vector Error Correction Model and Granger causality test. The study results show that government spending has increased consistently throughout the research period in both sectors studied. Government spending shows a permanent relationship with real gross domestic product at factor cost ($RGDP_{fc}$), while its short-term impact remains statistically insignificant. The social service sector shows a significant adjustment rate, which leads to its equilibrium state. The relationship between government spending and expenditure shows bidirectional causality. The relationship between electricity, drinking water expenditure and economic growth shows unidirectional causality according to the research. The relationship between spending on agriculture, communication, irrigation, education and local development and $RGDP_{fc}$ shows unidirectional causality, according to the research. The findings demonstrate how government resources should be distributed across various sectors to achieve sustainable economic growth. Attaining sustainable economic growth in Nepal requires efficient sectoral distribution of government spending. The study highlights the need for agricultural financial backing, water development, communication services and electricity supply because these sectors drive sustainable economic growth. The study offers valuable findings, but its use of historical data restricts its findings because this data cannot show modern policy changes. Future research may include fiscal policy reforms, and external economic shocks.*

Keywords: causality analysis, fiscal policy, sectorial allocation, stationary

JEL Classification Codes: E12, H51, H52, O47

I. INTRODUCTION

The relationship between government spending and economic development has been a major topic of discussion between economists and policymakers. Adam Smith and other classical economists argued that excessive government spending could impede long-term growth and advocated minimal government intervention, limited to the provision of public goods and law enforcement. Keynes (1936) established a new economic framework after the Great Depression because he demonstrated how fiscal policy functions as a tool for economic stabilization and supports long-term economic growth. Myrdal (1957) expanded Keynesian theories through his research on the need for government-driven economic development in developing nations. Neoclassical economists maintained that workforce and technical advancements drove economic growth while they reduced the value of government intervention.

Modern economies of emerging nations use public spending to achieve three main goals, which include better income distribution, effective resource distribution and control of national income distribution (Karki et al., 2023). The studies show contradictory results because researchers found different outcomes from public spending on economic growth. Researchers such as Al-Fawwaz (2016) and Kunwar (2019) reported positive effects, whereas Aydin and Esen (2019) and Obi et al. (2020) found no significant or negative effects. The studies conducted by Ahuja and Pandit (2020) and Karki et al. (2024) noticed that government expenditures lead to economic growth, which supports the principles of Keynesian economics. Research by Barlas (2020) and Hussin et al. (2012) revealed that public education spending leads to economic growth. Similarly, research by Digdowiseiso (2022) and Saidu and Ibrahim (2019) demonstrates that government spending has negative effects on economic growth.

The research conducted by Gaire (2012), Mainali (2012), and Shah and Bhusal (2017) proved that government expenditures and economic growth show a positive relationship in their findings about Nepalese economic development. The fiscal challenges Nepal faces, including increased recurrent expenditure, poor management of public funds, and insufficient funding for essential sectors such as agriculture and infrastructure development, have constrained the country's growth (Khadka et al., 2024; Upreti, 2002). The combination of political instability and budget deficits creates obstacles to economic development, which emphasizes the necessity for strategic resource distribution that will support sustainable economic progress (Gajurel, 2021; Nowak & Dahal, 2016).

This study examines the relationship between Nepal's economic growth and government spending on social and economic services, which drive real GDP expansion. Although the relationship between public spending and economic growth is widely known, detailed empirical research in the Nepalese context is limited. This study fills this gap by assessing sector-specific effects over both short- and long-run horizons using a Vector Error Correction Model (VECM). It assesses how capital expenditures and operational expenses differentially affect Nepal's economic growth, and shows that government spending impacts economic development in Nepal through its primary economic activity, representing the country's

main economic zone. The analysis of nearly five decades' worth of data provides critical insights that assist policymakers in determining the most effective government spending allocation to achieve economic advantages.

II. LITERATURE REVIEW

Developing countries experience public sector expansion, which matches their growing per capita income and industrial production rates (Wagner's Law, 1939). Wagner (1939) divided government spending into two categories, security and welfare, while he maintained that higher economic growth leads to increased public needs for educational, healthcare and banking services. Peacock and Wiseman's Hypothesis (1961) introduced the "displacement effect", which shows that government spending rises through separate stages after major social changes occur because three factors, displacement, inspection and concentration, operate together. According to Baumol's Productivity Lag Hypothesis (1972), the public sector requires extra worker resources because its productivity growth has decreased while its output needs stay the same.

The research by Baum and Lin (1993) established that educational funding has positive effects on economic output. The research demonstrates that government funding for agricultural development and educational improvement generates high economic returns for the country. Developed nations allocate resources to social security and healthcare services, while developing countries dedicate their resources to educational programs. Evidence from Nigeria (Iheanacho, 2016) and South Asian economies (Alshahrani & Alsadiq, 2014) indicates that educational investment, healthcare, and transport spending generally promote growth, though outcomes vary by sector and context.

Obi et al. (2020) observed that educational costs impeded Nigeria's economic growth, whereas Babatunde (2018) noticed that financial investments improved transportation and health and educational services. Bedir (2016) established that economic growth and healthcare development mutually affected each other in Russia and the Czech Republic. The research conducted by Amusa and Oyinlola (2019) found that total public spending in Nigeria has negative effects on the country's economic growth in the short term but generates positive effects over the long term. The investigation conducted by Chen et al. (2020) found that education, health, wages, and agriculture benefit from spending over time, whereas transportation and communication expenditures have negative effects on economic growth. Azam (2020) found that energy expenditures promote economic growth, whereas infrastructure spending has a negative relationship with economic growth. Ahuja and Pandit (2020) showed through their research that 59 developing countries experience one-way GDP growth, which links to public service spending, thus supporting Keynesian economic theory while showing how investment and trade barriers and population growth challenges impact the economy.

Gurdal et al. (2021) found a reciprocal association between economic development and government expenditure in G7 countries from 1980 to 2016. Meanwhile, Chen et al. (2020) demonstrated that expenditure on interest payments, wages, health, education,

and agriculture severely affected Vanuatu's growth. Zungu and Greyling (2022) explored that government spending in African economies positively impacts growth up to 27.84% of GDP; beyond this threshold, it negatively affects growth. Obi et al. (2020) identified unidirectional causality between state debt and government expenditure. Oanh et al. (2022) concluded that public spending stimulates growth, whereas private investment has a minimal impact. Gorkey (2023) found a long-term negative correlation between economic expansion and government spending, indicating potential inefficiencies over time. Dagne (2022) demonstrated that spending on agriculture, health, and infrastructure in Ethiopia positively contributes to long-term growth with a unidirectional causal relationship.

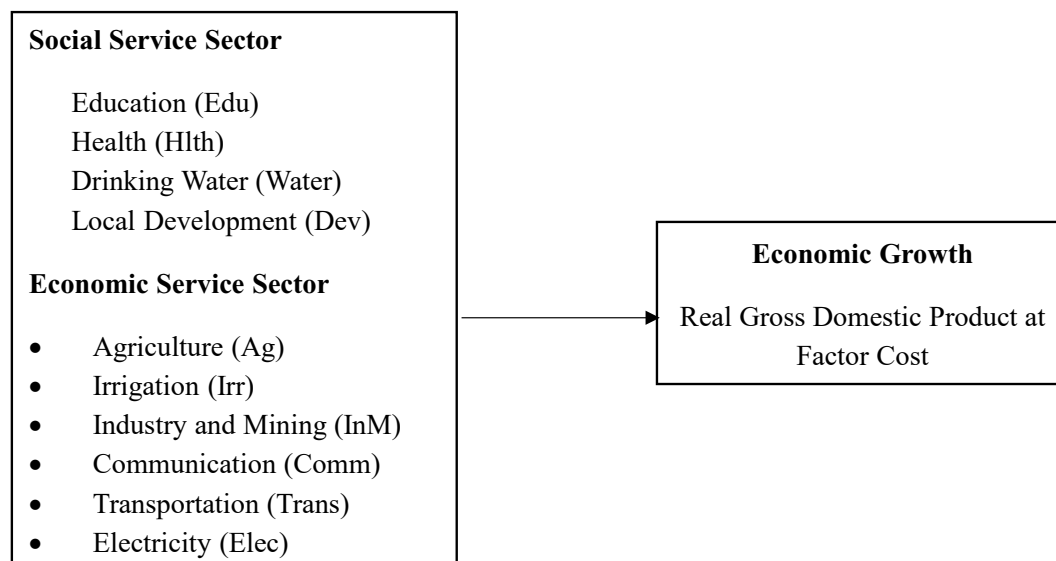
Jibir et al. (2023) revealed that Nigerian GDP growth showed positive results from government spending on social, economic and community service programs, while administrative costs created barriers that prevented immediate GDP expansion. Rahman et al. (2023) showed that government investments in education and communication and industrial development brought about GDP growth in SAARC nations, which proved both Wagner's Law and Keynesian economic theory to be correct. Shaukat et al. (2023) demonstrated that government spending generates positive impacts on both GDP and overall economic progress. Yusuf et al. (2023) identified capital expenditure as the fundamental element that drives economic growth. Buthelezi (2023) argued against making government spending permanent because he believed it would hinder economic growth, while recommending that governments should spend money only for short-term purposes, which would bring immediate economic benefits. Recent studies confirm these findings: capital expenditure drives GDP growth in Ghana (Mensah & Adukpo, 2025), agricultural spending boosts growth in Afghanistan (Hemat et al., 2025), and education expenditure has lasting effects in the US (Diakodimitriou, 2025).

In the Nepalese Context, Sharma (1999) identified the rise in recurrent expenditure over development spending as a key barrier to Nepal's economic growth from 1979 to 1994, a view supported by the World Bank (2000) and Upreti (2002), who highlighted inefficiencies and a resource gap. Khanal and Kanel (2005) noted reduced spending on agriculture and poverty programs, citing structural slowdowns and political instability as impediments to growth. Devkota (2010) and Mainali (2012) emphasized the positive impacts of spending on mining, industry, and infrastructure on Nepal's GDP. Nowak and Dahal (2016) found that education spending significantly impacts Nepal's GDP. Using ARDL, Shah and Bhusal (2017) found a long-run relationship between economic growth and government spending. Utilizing the ARDL, Kunwar (2019) revealed that government spending has a delayed beneficial effect on GDP. Kharel (2020) showed that education spending had a positive long-term effect, whereas health spending had a negative effect on GDP. Gajurel (2021) confirmed a positive association between economic growth and public spending but noted negative impacts on health and transportation spending. Paudel (2023) concluded that spending supports economic growth while balanced expenditures create advantages for sustained economic progress.

The literature on government expenditure reveals conflicting views on its relationship with economic growth. Keynesian theory suggests that increased spending stimulates growth,

while classical theory highlights reduced efficiency at higher spending levels. Studies on sectoral allocation and government spending trends, particularly in Nepal post-1990, show mixed findings. This study addresses gaps by examining the influence of government spending on social and economic services, focusing on their contributions to Nepal's economic growth and development.

Figure 1
The research framework



Note: Keynes (1936); Saad and Kalakech (2009), Ahuja and Pandit (2020); Waweru (2021)

III. RESEARCH METHODOLOGY

Descriptive and causal-comparative research designs were used in the study. A deductive approach has been taken as the study is intended to test existing theories. Nepal Rastra Bank started publishing data on government expenditure and GDP at factor cost only after 1974/75 A.D. Economic survey and annual macro-economic reports by the Ministry of Finance and NRB have been published up to fiscal year 2022/23 A.D. at the time of this study. So, all data on selected variables under study have been collected from 1974/75 A.D. to 2022/23 A.D. Secondary data were gathered from the sources mentioned in Table 1. However, for analysis, data have been converted to their natural logarithm form instead of being used in their original format.

Table 1*Sources of data*

Variables	Source	Previous Studies
Dependent Variable (Real Gross Domestic Product at factor cost)	Macroeconomic and Financial Situation Report (NRB website)	Paudel (2023), Karki et al. (2024)
Independent Variables (Sectorial Expenditure)	Economic Survey and Budgetary Documents	

Method of data analysis. The study is based on a post-facto investigation approach since the necessary data for analysis are already available. Data analysis has been conducted using time series econometric tools. Excel and E-Views software are employed for data evaluation.

The unit-Root Test establishes if the data exhibits a stationary trend. If the series is not stationary, the test identifies how often the variable needs to be differenced to achieve stationarity. In line with the approaches of Poku et al. (2022), Shaukat et al. (2023), and Buthelezi (2023), the unit root test is used to evaluate stationarity. Macroeconomic variables are consolidated to order one, $I(1)$, to facilitate the implementation of VECM.

The Johansen (1988) co-integration has been used to determine whether variables may trend towards a stable long-term equilibrium. The analysis took both trace and maximum eigenvalue tests to ascertain a long-run relationship, following methodologies by Poku et al. (2022) and Yusuf et al. (2023).

The vector Error Correction Model enhances the partial adjustment model through co-integration techniques, which traditionally account for short-run dynamics plus long-run equilibrium. Following the procedure of Iheanacho (2016), Giri (2022), Mansour (2023), and Buthelezi (2023) have used the following models for disaggregated analysis:

$$d(\ln \text{RGDP}_{\text{fc}}) = a + \beta_1 \text{ECM}(-1) + \beta_2 (d\ln \text{RGDP}_{\text{fc}}(-1)) + \beta_3 (d\ln \text{Edu}(-1)) + \beta_4 (d\ln \text{Hlth}(-1)) + \beta_5 (d\ln \text{water}(-1)) + \beta_6 (d\ln \text{Dev}(-1)) + \varepsilon \dots \text{ (i)}$$

$$d(\ln \text{RGDP}_{\text{fc}}) = a + \beta_1 \text{ECM}(-1) + \beta_2 (d\ln \text{RGDP}_{\text{fc}}(-1)) + \beta_3 (d\ln \text{Ag}(-1)) + \beta_4 (d\ln \text{Irr}(-1)) + \beta_5 (d\ln \text{InM}(-1)) + \beta_6 (d\ln \text{Comm}(-1)) + \beta_7 (d\ln \text{Trans}(-1)) + \beta_8 (d\ln \text{Elec}(-1)) + \varepsilon \dots \text{ (ii)}$$

$$d(\ln \text{RGDP}_{\text{fc}}) = a + \beta_1 \text{ECM}(-1) + \beta_2 (d\ln \text{RGDP}_{\text{fc}}(-1)) + \beta_3 (d\ln \text{Ag}(-1)) + \beta_4 (d\ln \text{Irr}(-1)) + \beta_5 (d\ln \text{InM}(-1)) + \beta_6 (d\ln \text{Comm}(-1)) + \beta_7 (d\ln \text{Trans}(-1)) + \beta_8 (d\ln \text{Elec}(-1)) + \beta_9 (d\ln \text{Edu}(-1)) + \beta_{10} (d\ln \text{Hlth}(-1)) + \beta_{11} (d\ln \text{water}(-1)) + \beta_{12} (d\ln \text{Dev}(-1)) + \varepsilon \dots \text{ (iii)}$$

Granger causality test. Examine the association of causality between federal spending and growth in the economy. The conventional Granger causality test, developed by Granger (1969), has been employed. The study followed the procedures outlined by Ray and Ray (2012), Aluthge et al. (2021), Waweru (2021), and Ahuja and Pandit (2020) to determine the direction of causality.

Residual test: Autocorrelation test. BG serial-correlation is used, following the procedure outlined by Gujarati (2009) as referenced in Jibir et al. (2023).

Heteroscedasticity test. Breusch-Pagan-Godfrey test in residuals of each time series regression, following the methodology established by Dkhar and De (2018).

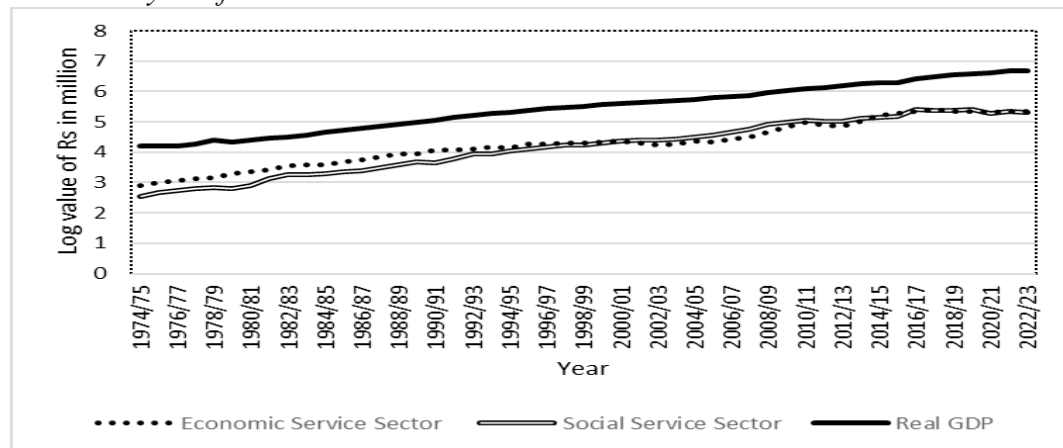
Normality. The normality of the error term was evaluated using the Jarque-Bera test, which assesses skewness (asymmetry) and kurtosis (fat tails), similar to the approaches used by Ghazouani et al. (2020).

CUSUM and CUSUMSQ Chart. CUSUM is designed to identify regular variations in the coefficients of regression. Null hypothesis: No structural change; is rejected if the CUSUM line remains within 5% significance level boundaries, following the procedure of Aluthge et al. (2021) and Jibir et al. (2023). CUSUMSQ extends CUSUM by focusing on changes in residual variance rather than the mean.

IV. RESULTS AND DISCUSSION

Government spending on social and economic services, along with real GDP_{fc}, shows a consistently rising trend from 1974/75 to 2022/23. Prior to the 21st century, economic service expenditure dominated, but social sector spending has since grown to match it, with both sectors broadly converging from 2010/11 onward.

Figure 2
Trend analysis of variables



The descriptive analysis in Table 2 shows a variety of government expenditures on economic growth. Real GDP_{fc} indicates significant economic activity and long-term fluctuations, as the mean value and standard deviation are higher. Sectors like health and electricity have lower mean values and standard deviations, reflecting lower government expenditure on those sectors over the study period. This difference highlights the uneven allocation of government expenditure among different sectors.

Table 2
Descriptive statistics

Variables (in Rs Million)	N	Min	Max	M	SD
Real GDP	49	15966.00	4732470.00	930994.40	1312204.00
Agriculture	49	97.90	76249.70	15019.29	23577.09
Irrigation	49	75.80	32856.40	3009.18	4813.59
Industry & Mining	49	74.10	106833.90	7176.88	23958.48
Communication	49	28.20	28463.70	2243.04	4248.06
Transportation	49	357.30	112702.90	14799.20	27345.01
Electricity	49	42.10	51267.90	6615.44	9499.98
Education	49	154.20	108590.10	21132.52	27549.89
Health	49	87.90	79347.08	12483.07	19278.84
Drinking Water	49	26.40	24521.10	4201.07	5722.87
Local Development	49	37.00	119373.50	13786.00	25248.44

Unit root test. Table 3 presents the ADF and PP unit test results for stationarity initially; every variable is random at the level. However, after first differencing, variables demonstrate stationarity, with ADF and PP statistics achieving significance at a 1% level. This indicates that variables constitute an integration of order one, i.e., become stationary after one differentiation, satisfying the necessary condition for the cointegration test using VECM.

Table 3
Unit root test

Variables	ADF Statistics		PP Statistics	
	Level	First Difference	Level	First Difference
ln(RGDPfc)	-0.292	-7.221*	-0.293	-7.219*
ln(Ag)	-0.796	-7.927*	-0.781	-7.867*
ln(Irr)	-2.299	-8.945*	-2.209	-9.025*
ln(InM)	-0.223	-7.699*	0.150	-7.760*
ln(Comm)	-1.843	-10.073*	-1.638	-10.915*
ln(Trans)	-2.006	-7.597*	-2.000	-7.592*

ln(Elec)	-2.579	-9.046*	-2.829	-9.707*
ln(Edu)	-1.698	-9.197*	-1.666	-10.139*
ln(Hlth)	-0.304	-7.239*	-0.276	-7.282*
ln(Water)	-1.751	-7.027*	-1.926	-7.131*
ln(Dev)	-1.281	-5.465*	-1.282	-5.347*

* denotes significant at 1 % level.

Note: E-views output

Co-integration test. The results of cointegration tests, which assess the existence of cointegrating equations (CEs) in three models, are shown in Table 4. Since the eigenvalue and trace statistics P-values are less than 0.05, all models reject the null hypothesis that there is no cointegration. Model iii shows the strongest evidence of cointegration, indicated by the highest eigenvalue and trace statistic, suggesting a significant long-term relationship between variables.

Table 4

Cointegration test result

Model	Hypothesized no. of CE(s)	Eigenvalue	P-value	Trace stat	P-value
i	1	29.6638	0.0452**	49.6385	0.0472*
ii	4	28.1230	0.0427**	57.7404	0.0045**
iii	3	63.0628	0.0165**	72.08	0.0326**

** p-value significant at 5% level

Vector error correction model. Model ‘i’ in Table 5 highlights significant long-run elasticities for government expenditure on social services. While education spending negatively impacts real GDP, likely due to inefficient allocation, investments in health and drinking water positively contribute to economic development. These results emphasize targeted spending on health and drinking water and the need for better allocation and utilization of education expenditure to enhance its effectiveness. Model ‘ii’ shows long-run elasticities of government spending in the economic-service sector. Government expenditure on communication and electricity increases are associated with GDP growth of 2.95% and 2.88%, respectively. An Increase in irrigation and transportation has negatively impacted real GDP, showing inefficiencies in these sectors. Model ‘iii’ reveals significant long-run elasticities for government spending in both social and economic service sectors. Agricultural and irrigation expenditures contribute to economic growth, while transportation and health expenditures negatively correlate. Education spending demonstrates a strong positive impact, underscoring its critical role in promoting long-term economic development.

Table 5*Long-run elasticity*

Particulars	Social Service Variable	Economic Service Sector	Social as well as economic service
	Model i.	Model ii.	Model iii.
LnAg	-	-0.54262 (1.2304) [0.4410]	-0.4282* (0.1805) [-2.3724]
LnIrr	-	2.6520* (0.6546) [4.0508]	-0.3954* (0.1213) [-3.2579]
LnInM	-	0.8774 (0.8823) [0.9944]	-0.2593 (0.1531) [-1.6929]
LnComm	-	-2.9521* (0.8957) [-3.2957]	-0.0057 (0.1065) [-0.0540]
LnTrans	-	1.8789* (0.7681) [2.4460]	0.2533* (0.1213) [2.0873]
LnElec	-	-2.8819* (0.6444) [-4.4720]	0.4230* (0.0918) [4.6049]
LnEdu	0.1579* (0.0591) [2.6716]	-	-2.7374* (0.1810) [-15.1216]
LnHlth	-0.4168* (0.0859) [-4.8519]	-	0.9606* (0.2260) [4.2502]
LnWater	-0.5578* (0.0840) [-6.6356]	-	0.8673* (0.3245) [2.6721]
LnDev	-0.0969 (0.0573) [-1.6916]	-	0.2257 (0.1208) [1.8678]
C (Constant)	-5.8758	-15.6235	-1.5465

*Note: Coefficients, the value in () indicates standard error and the value in [] indicates t-value. *t-value greater than ± 1.96 indicates significant impact at 5% level.*

Short-run VECM. Model 'i' in Table 6 shows 17.28% disequilibrium is corrected per period (one year), indicating slow adjustment towards long-run equilibrium. While long-term relationships between real GDP and social services are significant, short-term dynamics are not significant. Any deviations from the long run equilibrium are not rapidly corrected in the short run. Model 'ii' indicates an insignificant error correction mechanism, with only 0.42% of disequilibrium corrected per period. This suggests slow or minimal short-term adjustment, and the insignificance of variables implies a limited immediate impact of sectoral fluctuations on GDP. Model 'iii' shows a slow adjustment towards long-run equilibrium, with 8.54% deviations only corrected in one one-year period between RGDP

and government expenditures. Sectoral government expenditures are at a significantly low level, showing no corrections for deviations in the short run.

Table 6
Short-run VECM result

Particulars	Social Service Variable	Economic Service Sector	Social and Economic Service Sectors
	Model i	Model ii	Model iii
Co-integrating equ. 1	-0.1728* (0.0563) [-3.0685]	-0.0042 (0.0045) [-0.9383]	-0.0854 (0.0100) [-0.8527]
D(log(RGDPFC)-1).	-0.2162 (0.1571) [-1.3755]	-0.0779 (0.1650) [-0.4725]	-0.0874 (0.1827) [-0.4787]
D(log(Ag)-1).		-0.0117 (0.0156) [-1.3234]	-0.0521 (0.0707) [-1.3512]
D(log(Irr)-1).		0.0053 (0.0198) [0.2697]	0.0156 (0.0390) [0.4018]
D(log(InM)-1).		0.0262 (0.0229) [1.1472]	0.0302 (0.0251) [1.2054]
D(log(Comm)-1).		-0.0009 (0.0161) [-0.0563]	-0.0007 (0.0176) [-0.0398]
D(log(Trans)-1).		0.0175 (0.0177) [0.9922]	0.0154 (0.0188) [0.8195]
D(log(Elec)-1).		-0.0050 (0.0193) [-0.2619]	0.0084 (0.0187) [0.4526]
D(log(Edu)-1).	0.0263 (0.0186) [1.4118]		0.0096 (0.0369) [0.2609]
D(log(Hlth)-1).	-0.0385 (0.0666) [-0.5779]		-0.0498 (0.0887) [-0.5643]
D(log(Water)-1).	-0.0520 (0.0375) [-1.3854]		-0.02863 (0.0444) [-0.6502]
D(log(Dev)-1).	0.0039 (0.0244) [0.1597]		0.02329 (0.0324) [0.7170]
Intercept.	0.1550 (0.0213) [7.2725]	0.1271 (0.0227) [5.5888]	0.13186 (0.0247) [5.3293]

*Note: Coefficients, the value in () indicates standard error and the value in [] indicates t-value. *t-value greater than ± 1.96 indicates significance at a 5% level.*

Granger causality. Results of GC (Table 7) show a bidirectional relationship between electricity and drinking water services to economic growth and a strong interplay between this sector and economic performance. In contrast, expenditures on transportation, health industry and mining were found to have no significant causal links to $RGDP_{fc}$, i.e., transportation expenditure may not respond dynamically in the short run to economic changes. Additionally, education and local development exhibit unidirectional causality, with economic growth influencing specific sectors of government expenditure but not vice versa. Agriculture was found to influence economic expansion in the short-run. This indicates the agriculture sector plays an important role in growth, while economic expansion may result in health, communication, irrigation, and education improvements.

Table 7
Result of GC test

Null Hypothesis.	F-Statistic	Prob.	Result
Ag doesn't GC $RGDP_{fc}$.	2.54758	0.0175	Unidirectional
$RGDP_{fc}$ doesn't GC Ag.	2.41523	0.1272	
Comm doesn't GC $RGDP_{fc}$.	2.66575	0.1095	Unidirectional
$RGDP_{fc}$ doesn't GC Comm.	14.7460	0.0004	
Elec doesn't GC $RGDP_{fc}$.	4.82083	0.0333	Bidirectional
$RGDP_{fc}$ doesn't GC Elec.	8.30506	0.0060	
Irr doesn't GC $RGDP_{fc}$.	0.14327	0.7068	Unidirectional
$RGDP_{fc}$ doesn't GC Irr.	4.45902	0.0403	
InM doesn't GC $RGDP_{fc}$.	0.84818	0.3620	No causality
$RGDP_{fc}$ doesn't GC InM.	3.12718	0.0538	
Trans doesn't GC $RGDP_{fc}$.	1.21636	0.2759	No causality
$RGDP_{fc}$ doesn't GC Trans.	0.64395	0.4265	
Water doesn't GC $RGDP_{fc}$.	7.54409	0.0086	Bidirectional
$RGDP_{fc}$ doesn't GC Water.	5.20696	0.0273	
Edu doesn't GC $RGDP_{fc}$.	1.86097	0.1793	Unidirectional
$RGDP_{fc}$ doesn't GC Edu.	7.68023	0.0081	
Hlth doesn't GC $RGDP_{fc}$.	1.62945	0.2083	No Causality
$RGDP_{fc}$ doesn't GC Hlth.	3.59985	0.0642	
Dev doesn't GC $RGDP_{fc}$.	0.16262	0.6887	Unidirectional
$RGDP_{fc}$ doesn't GC Dev.	6.03561	0.0179	

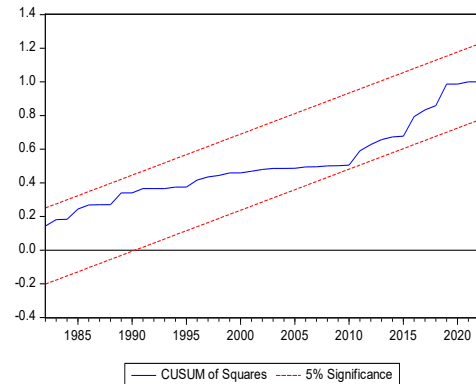
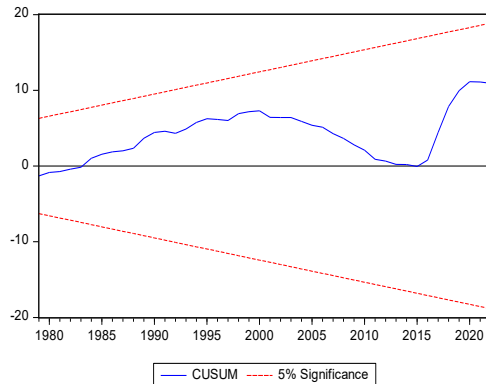
Note: GC denotes Ganger Cause

Residual check. The Breusch-Godfrey test reveals slight autocorrelation only in model ‘ii’ (no serious concern) with F-statistic value 5.6028, while models ‘i’ (F-statistic = 2.9970) and ‘iii’ (F-statistic = 0.6334) show no serial correlation. Heteroscedasticity confirms no heteroscedasticity across all models (F-statistic values of 0.6155, 1.1256 and 0.5259 in models ‘i’, ‘ii’ and ‘iii’ respectively), ensuring constant error variance. Normality test ensures residuals are normal, as evidenced by minimal skewness, slight platykurtosis, and high p-values in the Jarque-Bera test.

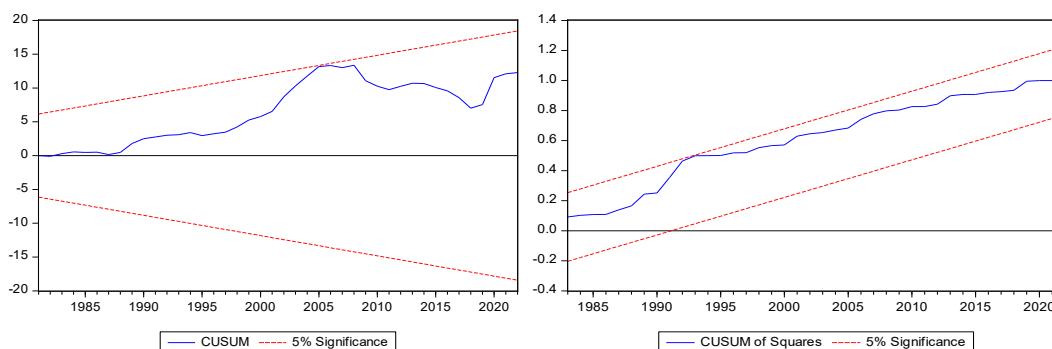
CUSUM & CUSUMSQ Chart. The residual tests across models i, ii, and iii indicate no major violations of key regression assumptions. The CUSUM chart in Figure 3 shows no significant structural breaks in coefficients. Although the CUSUMSQ test displays variations in trend, residual variance remains within higher and lower bounds, showing no significant structural breaks. The findings support all models’ robustness and ensure reliable coefficient estimates for inferencing, forecasting, and policy analysis during the examined period.

Figure 3
CUSUM & CUSUMSQ

Model i



Model ii



Model iii

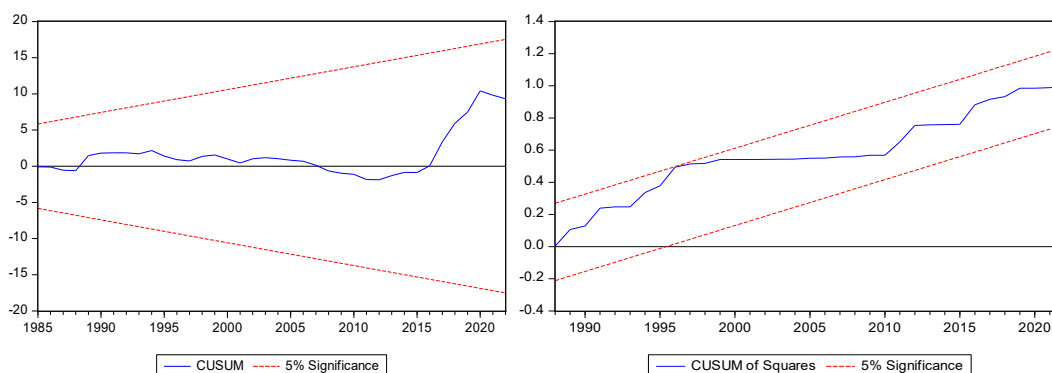


Table 8

Summary of hypothesis

Hypothesis	Accept/ Reject	Effect
H1: GE on Ag and EG have an immediate and prolonged relationship.	Accepted	Prolonged
H2: GE on Irr and EG have an immediate and prolonged relationship.	Accepted	Prolonged
H3: GE on InM and EG have an immediate and prolonged relationship.	Rejected	-
H4: GE on Comm and EG have an immediate and prolonged relationship.	Accepted	Prolonged
H5: GE on Trans and EG have an immediate and prolonged relationship.	Accepted	Prolonged
H6: GE on Elec and EG have an immediate and prolonged relationship.	Accepted	Prolonged
H7: GE on Edu and EG have immediate and prolonged relationships.	Accepted	Prolonged
H8: GE on Hlth and EG have an immediate and prolonged relationship.	Accepted	Prolonged
H9: GE on Water and EG have an immediate and prolonged relationship.	Accepted	Prolonged
H10: GE on Dev and EG have an immediate and prolonged relationship.	Rejected	-
H11: GC exists between GE in Ag and EG.	Accepted	Unidirectional (Ag EG)

H12: GC exists between GE in Irr and EG.	Accepted	Unidirectional (EG Irr)
H13: GC exists between GE in InM and EG.	Rejected	-
H14: GC exists between GE in Comm and EG.	Accepted	Unidirectional (EG Comm)
H15: GC exists between GE in Trans and EG.	Rejected	-
H16: GC exists between GE in Elec and EG.	Accepted	Bidirectional
H17: GC exists between GE in Edu and EG.	Accepted	Unidirectional (EG Edu)
H18: GC exists between GE in Hlth and EG.	Rejected	-
H19: GC exists between GE in Water and EG.	Accepted	Bidirectional
H20: GC exists between GE in Dev and EG.	Accepted	Unidirectional (EG Dev)

Note: GC: Ganger Causality; GE: Government Expenditure; EG: Economic Growth.

Nepal has experienced constant growth in government expenditures, which matches the pace of Real GDP growth when calculating expenses for social and economic services. The focus on economic service expenditures before 2000 has shifted toward an equal distribution between social and economic funding since the start of the 2010/11 fiscal year. The research conducted by Oanh et al. (2022), Shaukat et al. (2023), and Zungu and Greyling (2022) demonstrates that strategic investments lead to improved productivity, which drives economic development.

The empirical analysis confirms a substantial long-term association between government expenditure and economic expansion. The cointegrating vectors across different models demonstrate that government spending drives economic development, while economic growth leads to higher public investment. The research findings support the work of Chandio et al. (2016), Gorkey (2023), Gurdal et al. (2021), and Shah and Bhusal (2017), which demonstrate that government-funded projects are vital to building economic stability. The VECM method shows that government spending undergoes short-term adjustments that occur gradually, because the system requires more than one full correction to complete its process. The structural constraints, together with policy inefficiencies and economic change that occurs in small steps, create obstacles that prevent rapid realignment, according to findings that align with those of Amusa and Oyinlola (2019). The slow correction process demonstrates that Nepal needs to develop long-term policy strategies that will help the country manage its fiscal resources effectively.

The economic development of a country depends on government expenditures for health services, educational programs and drinking water distribution in social service sectors. The effects of those activities become apparent after a prolonged period because they operate through various indirect pathways. The study by Chen et al. (2020), Hussain et al. (2012), and Saad and Kalakech (2009) demonstrates that social sector funding yields sustained productivity improvements. The economic importance of agriculture for Nepal's economy receives confirmation from

economic data, which demonstrates that agricultural spending creates lasting effects on agricultural development. The research shows that investments in electricity infrastructure create long-term economic benefits because they demonstrate that energy resources serve as essential elements for increasing industrial output. The research findings of the study match the established results from Ghazouani et al. (2020) and Zhang et al. (2017). Studies demonstrate that transportation expenses create adverse effects that impede economic progress because they cause resource distribution and management issues.

The results of GC tests demonstrate that government spending has complicated effects on economic development. The relationship between government spending on drinking water and electricity and GDP growth operates in both directions, demonstrating that government spending and economic growth help each other in these areas. The relationship between GDP and agricultural expenditures is unidirectional, indicating that agriculture serves as Nepal's vital economic foundation, consistent with Azam (2020) and Chandio et al. (2016). The relationship between GDP and spending on communication, irrigation, education and local development follows Biyase and Zwane (2015) and Srinivasan (2013), while contradicting Ahuja and Pandit (2020) and Bedir (2016). The economic conditions of Nepal show that public investment functions as an economic growth response and an active force that develops different sectors of the economy.

V. CONCLUSION AND IMPLICATIONS

The research evaluated how government fiscal spending influenced economic growth in Nepal through its assessment of both short-term and long-term impacts on different economic sectors. The results show that government spending has a major effect on long-term economic growth, though sectors vary in their responses. The government maintained social and economic service spending patterns that increased over time, but after 2000, the government redirected its financial resources toward social services while decreasing funding for economic services. The current system distribution of resources among various sectors, together with existing wasteful spending methods, requires officials to develop improved operational management strategies.

The Keynesian economic theory shows that governments must use their power to create economic progress. The research demonstrates that Wagner's Hypothesis holds true because it predicts that economic systems will increase their public expenditure. The research results prove that resource distribution optimization is essential because proper resource distribution results in better economic performance and increased growth possibilities. The research presents direct policy recommendations while providing essential empirical information about public spending patterns in developing countries, especially in Nepal. The study needs to identify multiple boundaries that limit its research capabilities. The study uses quantitative methods for analysis but overlooks the essential qualitative factors which determine how government funding affects operational efficiency, institutional capabilities

and policy execution. The study misses vital economic shock factors, geopolitical events and private sector financial impacts, which are crucial for accurate economic prediction. The elements that impact government spending need to be studied in future research because they determine how spending affects sustainable economic growth.

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