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Government Expenditure and Economic Growth in Nepal

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Abstract

This study aims to investigate the relationship between the government expenditure on education, health, transportation, agriculture, and economic growth in Nepal from 1975 to 2019. The ARDL approach to co-integration and error correction approach is used to detect the long-run and the short-run relationship between RGDP and exogenous variables in the model. The study revealed the significant and positive impact of educational expenditure on economic growth in the long run. Similarly, health expenditure has a significant but negative impact on GDP in the long-run as well as in the short-run. Moreover, agriculture expenditure of the government is found to have a significant but negative impact on GDP in the long-run. The transportation expenditure is found to be insignificant. The study concludes that government expenditure along with spending pattern, channel of spending and effectiveness of spending are equally important to examine the true effect of government expenditures on economic growth.

Keywords: *Government expenditure, Economic growth, ARDL, ECM.*

Introduction

The central, state, and local governments make the public expenditure to satisfy the collective needs that the individual capacity is not able to satisfy and promotes the economic and social welfare of the citizen. In the 19th century, the economist paid a very little attention to public expenditure and the functions of the government were restricted to justice, police, and arms (Lekhi & Sing, 2008). However, in modern times, the subject of public expenditure has earned great significance. The function of government expenditure is to play a prominent role in reducing regional disparities, developing social overheads, creation of infrastructure, education and training, growth of capital goods industries, and promotion of other development agenda in developing economics.

There are several contradictions and opposing views on government expenditure and its impact on economic growth. The classical economists like J. B. Say and A.C. Pigou were in the favor of a balanced budget with the minimum public expenditure

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and laissez fair economy who opined that if the government increases its expenditure without increasing the revenue leads to inflation in an economy (Shapiro, 1984). On the contrary, Keynes believed that an increase in government expenditure especially at the time of depression can enhance the effective demand thus boost economic growth.

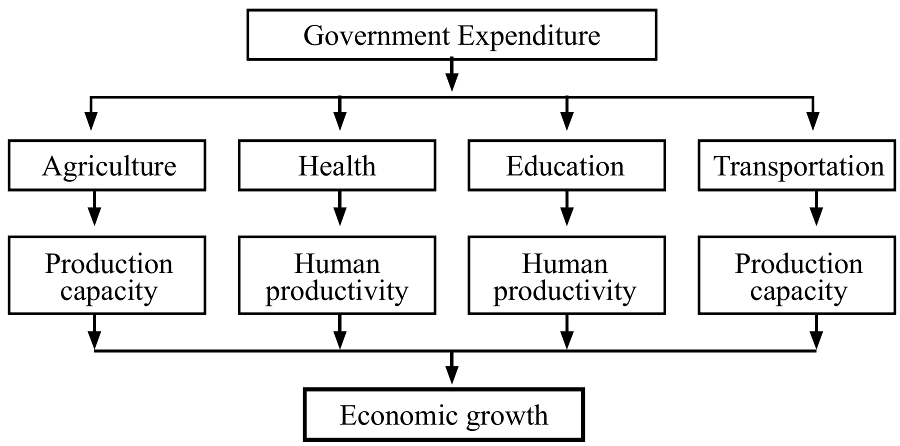
Peacock-Wiseman hypothesis dealing with the growth of public expenditure argued that public expenditure does not increase smoothly and continuously but in jerks or step-like fashion (Kennedy, 2012). Clark (1945) advanced the public expenditure hypothesis immediately after the II - World War which is also known as the critical limit hypothesis and is concerned with the tolerance level of taxation. Clark argued that government expenditure over the critical limit which is twenty-five percent of the aggregate economic activity in the country leads to exhausted ability to pay a tax of the taxpayers. This leads to a fall in production and reduced supply which ultimately affects the incentive to produce and invest adversely. Boumal (1972) developed a hypothesis based on the productivity differential of the private and public sectors. Boumal argued that when the economy is not automatically stabilized, then expansion in government expenditure is required and the productivity gains are less likely to be experienced in the public sector than in the private sector. Baumol has given technical and institutional barriers as causes that crate productivity lag.

Again, Pigou's ability to pay theory depicts that the people are to be charged according to the cost of production. But that will not be sufficient to maintain transfer expenditure like pension, old age allowances, debt services, and non-transfer expenditure such as the defense and civil administration. Thus, the optimum amount of government expenditure is to be determined at which the satisfaction obtained from the last rupee spent is equal to the satisfaction lost in respect of the last rupee (Mainali, 2012). Lindahl's benefit principle of government expenditure is based on the principle of two individuals in society i.e. the public good and the constant cost of the public good. According to him, government expenditure is to be made in such a way that the revenue collected from the people should be equal to the cost of production (Lekhi & Sing, 2008)

The budget decisions of the government affect people's everyday lives and future and influence their work, the transport they use, health care available to them, and the level of education children have. The budget reflects the country's socio-economic policy priorities by translating policies and political commitments into expenditures and taxation (Ghaleb, 2001).

Hence, this study attempts to examine government expenditure education, health, transportation, and agricultural sector and also its role in economic growth. In the Keynesian model, increase in government expenditure on infrastructure leads to high economic growth. On the contrary, neo-classical growth models argue that fiscal policy does not have any effect on the growth of national output. However, there exist an argument for government fiscal policy (intervention) that helps to improve failure which could arise from the inefficiencies of the market. Government expenditure on various sectors like education, health, transportation and agriculture enhance the human productivity and productive capacity of an economy thereby resulting the economic growth of the country which can be explained by the following conceptual framework.

Chart 1: A Framework for Public Expenditure and Economic Growth



Review of Literature

Shah and Bhusal (2017) empirical identified the relationship between public expenditure and economic growth in Nepal. The study employed ARDL bound test on data set from 1975 to 2016 and found that government expenditure has a significant influence on real GDP and confirms the Keynesian theory of making government expenditure to boost economic growth in Nepal.

Mallik, Das, and Pradhan (2016) investigated the impact of educational expenditure on economic growth in selected 14 major Asian countries using balanced panel data from 1973 to 2012. The study employed a panel vector error correction mechanism (P-VECM) and found unidirectional Granger Causality running from economic growth to expenditure on education both in the short-run as well as long-run. However, expenditure on education only granger caused economic growth in the long run in all countries.

Nowak and Dahal (2016) investigated the long-run relationship between education and economic growth in Nepal between periods of 1996 to 2013 employing OLS multiple regression. The study found that secondary and higher education contributed significantly to the real GDP per capita in Nepal and elementary education also positively influenced the economic growth whereas the result was statistically less significant.

Acharya (2016) has analyzed the relationship between public expenditure and economic growth in Nepal from 1975 to 2015. Using the Autoregressive Distributed Lag (ARDL) and Error Correction Model (ECM). The study found a positive and significant relationship between public expenditure and economic growth both in the long-run and the short-run.

Boussalem, Boussalem, and Taiba (2014) investigated the direction of the causal relationship between public spending on health and economic growth in Algeria from 1974 to 2014. The paper integrated the error correction model into the traditional Granger Causality test and found a unidirectional causal link running from GDP to public spending on health. However, public spending on health did not Granger cause per capita GDP growth with a positive sign.

Bhusal (2014) has analyzed relationship between government expenditure and economic growth in Nepal. Using the Johansen co-integration test and error correction model (ECM); the existence of both short-run and long-run relationship between government expenditure and economic growth was confirmed. Further, and Granger causality test revealed that Government expenditure granger causes economic growth but economic growth does not Granger causes government expenditure the case of Nepal. Further, the study found that the Wagnerian hypothesis does not exist in the Nepalese economy.

Mainali (2012) examined the causal relationship between government expenditure and the GDP with the time series data from 1975 to 2007. Co-integration estimation was detected to find the long-run equilibrium stability, and an error correction model was estimated for short-term analysis. The study revealed the positive significant impact of government recurrent and capital expenditure and the negative impact of miscellaneous and contingency expenditure on GDP. Mainly, the study concluded that the government expenditure is growth-promoting although highly increasing recurrent expenditure caused the burden of loan repayment and interest rate.

Maitra and Mukhopadhyay (2012) investigated the role of public spending on the education and health sectors to promote the GDP of 12 countries of Asia and the pacific over three decades. The Vector Error Correction model found that the impact of education and health sector expendutureon GDP growth was not an instantaneous process

Mudaki and Masaviru (2012) examined the impact of public expenditure on education, health, economic affairs, defense, agriculture, transport, and communication on economic growth in Kenya from 1972 to 2008. The ordinary least square method found that expenditure on education was a highly significant determinant of economic growth while expenditure on economic affairs, transport, and communication were also significant although weakly. On the other side, expenditure on agriculture was found to have a significant but negative impact on economic growth. Expenditure on health and defense were all found to be insignificant determinants of economic growth

Muktdair-Al-Mukit (2012) analyzed about the long-run relationship between public expenditure on educational sector and economic growth in Bangladesh. The study employed OLS regression model with time-series data from 1995-2009. The investigation showed the positive impact of public spending on education on economic growth in the long-run. The study suggested the government of Bangladesh increase its public spending on education as well as develop quality of education.

Narayan, Narayan, and Mishra (2010) examined the long-run impact of health and education expenditure on economic growth for the panel of five Asian countries from 1974 to 2007. Employing production function approach study concluded that education did not contribute to economic growth in all countries. In the case of Nepal, Indonesia, and Sri Lanka borrowing to spend on education was not recommended since it is risky and can threaten the sustainability of the economy. On the other side, the study revealed a positive contribution of health to economic growth however, the magnitude of the impact of health seemed to be very low.

Shrestha (2009) investigated the role of public expenditure on physical infrastructure over economic growth in Nepal based on the endogenous growth model using the time series data for the period 1981-2007 and found a positive relationship between public expenditure on infrastructure and economic growth. The author suggested allocating more resources to develop physical infrastructure in Nepal, which not only facilitates private productive activities but also generates employment in the economy for the mass unemployment.

Baldacci et al., (2008) explored the channels linking social spending, human capital, and growth in developing countries using endogenous growth model and found that both education and health expenditure has a positive and significant impact on education and health capital and thus support higher growth.

Acharya (2016), Mainali (2012), and Sharma (2012) examined the impact of government expenditure in economic growth in Nepal. Further, Nowak and Dahal (2016) examined the impact of expenditure on education and physical infrastructure in economic growth respectively. However, there is still a paucity of research on the individual impact of expenditure on transportation, agriculture, health and education on economic growth of Nepal. This study aims at fulfilling existing gap by examining the impact of government expenditure on health, education, transportation and agriculture in Nepal.

Research Methodology

Data and Variables

This study used secondary sources covering 45 years of time series data from the FY 1974/75 to 2018/19 AD. The gross domestic product, government expenditure on education, health, transportation, and agriculture, the openness of trade, broad money supply, and total other expenditure of government are the variables used for empirical analysis.

Table 1: Sources and Measurement of Variables (In Rs. Million)

Variables Descriptions	Source
Real Gross Domestic Product (RGDP)	Current Macroeconomic and Financial Situation, (NRB, 2020)
Sectoral [Health (HEA), Education (EDU), Transportation (TRA), Agriculture (AGRI)] and Total other expenditure (TO)	Various issues of Economic Survey and budgetary documents (MoF, 2020)
Openness of trade (OT)	Current Macroeconomic and Financial Situation (NRB, 2020)
Broad money supply (M_2)	Current Macroeconomic and Financial Situation (NRB, 2020)

This study used real GDP as an endogenous variable. The total government expenditure on education, health, transportation, agriculture, and total other expenditure in a fiscal year includes both the current and capital spending on the specific sector by the Government of Nepal (GoN). The broad money supply includes the deposits maintained in the form of time deposits (TD) and the currency at the hands of the non-bank public. Similarly, the amount of total international trade to GDP ratio is known as trade openness.

Model Specification

To meet the research objective, the study has employed the following functional model based on the Keynesian framework of government spending. Here, the endogenous variable is RGDP, and government expenditure on health (HEA), education (EDU), transportation (TRA), agriculture (AGRI), and total other expenditures (OTE), broad money supply (M_2), and openness of trade (OT) are exogenous variables.

$$RGDP = f(EDU, HEA, TRA, AGRI, OTE, M2, OT) \ldots\ldots\ldots (1)$$

Linear transformation of equation (1) using log is shown in equation (2) as;

$$LnRGDP_t=\beta_0+\beta_1 LnEDU_t+\beta_2 LnHEA_t+\beta_3 LnTRA_t+\beta_4 LnAGRI_t+\beta_5 LnOTE_t+\beta_6 LnM2_t+ \beta_7 LnOT_t+U_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Here, is intercept; are respective coefficients and is the error term. Using equation (2), It is examined the relationship between government expenditure and economic growth in Nepal. For this, it has transformed all the available data in real term and put in the model.

ARDL Approach to Co-integration

There are several techniques of conducting the co-integration analysis and the popular approaches among them are the well-known residual-based approach proposed by Engle and Granger (1987), the Maximum Likelihood approach proposed by Johansen and Juselius (1990), and Johansen (1988), and Autoregressive Distributed Lag (ARDL) approach to co-integration developed by Pesaran et al., (2001).

This study has used the ARDL bounds testing approach to co-integration for checking the existence of long-run and short-run relationship among variables. The model has been estimated by using Auto-Regressive Distributed Lag (ARDL) approach to co-integration. We can use the ARDL model if the variables are integrated of purely I(0), purely I(1), or mutually integrated.

Following the ARDL approach proposed by Pesaran and Shin (1999), the ARDL version of equation (2) is presented in equation (3);

$$\Delta LnRGDP_t = \alpha_0 + \sum_{j=1}^{p} b_j \,\Delta LnRGDP_{t-j} + \sum_{j=0}^{q} c_j \,\Delta LnEDU_{t-j} + \sum_{j=0}^{r} d_j \,\Delta LnHEA_{t-j} + \sum_{j=0}^{s} e_j \Delta LnTRA_{t-j} + \sum_{j=0}^{t} f_j \,\Delta LnAGRI_{t-j} + \sum_{j=0}^{w} g_j \,\Delta LnOTE_{t-j} + \sum_{j=0}^{x} h_j \,\Delta LnRM2_{t-j} + \sum_{j=0}^{y} i_j \,\Delta LnOT_{t-j} + \gamma_1 LnRGDP_{t-1} + \gamma_2 LnEDU_{t-1} + \gamma_3 LnHEA_{t-1} + \gamma_4 LnTRA_{t-1} + \gamma_5 LnAGRI_{t-1} + \gamma_6 LnOTE_{t-1} + \gamma_7 LnM2_{t-1} + \gamma_8 LnOT_{t-1} + U_t \dots\dots\dots\dots\dots\dots\dots (3)$$

Here, all the variables are as previously defined. is the intercept. are the respective long-run coefficients while represents the short-run dynamics and is the random disturbance term.

To test whether the long-run equilibrium relationship exists between real GDP and explanatory variables, the bound test (F-version) for co-integration is carried out as proposed by Pesaran and Shin (1999). Hypotheses for testing the long-run level relationship between the variables are;

Null Hypothesis(H_0): $\gamma_1 = \gamma_2 = \gamma_3 = \gamma_4 = \gamma_5 = \gamma_6 = \gamma_7 = \gamma_8 = 0$*; No Co-integration exists.*
Alternative Hypothesis(H_1): $\gamma_1 \neq \gamma_2 \neq \gamma_3 \neq \gamma_4 \neq \gamma_5 \neq \gamma_6 \neq \gamma_7 \neq \gamma_8 \neq 0$*; Co-integration exists.*

Here, the F-statistic is then compared with the critical values provided by Pesaran et al., (2001). The null hypothesis of no co-integration is rejected if the computed F-statistic is higher than the appropriate upper bound of the critical values; if it is below the appropriate lower bound, the null hypothesis cannot be rejected; and if it is lies within the lower and upper bounds, the results is inconclusive. Once, the co-integration among the variables is ensured with the F-bound test, the next step is to estimate the long-run and short-run relationship based on the appropriate lag selection criteria.

Further, lagrange multiplier (LM) test for serial correlation, Ramsey reset test (RESET) for functional form misspecification, Jarque-Bera test for normality, and KB test for Heteroscedasticity are carried out for the diagnostic tests of the model. Similarly, for the stability test of the model, CUSUM and CUSUMSQ tests are carried out.

Results and Discussion

The Augmented Dickey-Fuller test and the Phillips-Perron test are considered to check the stationarity of the time series. Table-2 presents the result of ADF and PP test of the variables used in the study.

Table 2: Result of Unit Root Test

Variables	ADF Statistics		PP Statistics	
	Level	First Difference	Level	First Difference
LnRGDP	0.9636	-7.4697*	1.2297	-7.6085*
LnEDU	-1.509	-3.486**	-2.1512	-3.5638**
LnHEA	-1.349	-10.701*	-2.0257	-17.6631*
LnTRA	0.014	-7.316*	0.1474	-7.2857*
LnAGRI	-1.394	-7.686*	-1.3713	-7.6796*
LnOTE	-0.716	-5.760*	-0.7272	-5.7282*
LnM2	-0.795	-6.947*	-0.8998	-7.3771*
LnOT	-0.040	-7.506*	0.3484	-7.9423*

Source: Authors' calculation

Note: * and ** denote the coefficients at 1 and 5 percent level of significance.

Here, both the test revealed the unit root problem of all the variables at level form whereas stationary after first differencing. Thus, it is confirmed that all the variables are integrated of order I (1).

Based on Akaike Information Criterion (AIC), three lag is chosen for each variable in their autoregressive distributed lag structure to identify the co-integrating relationship among the variables that is presented in Table-3.

Table 3: VAR lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SBIC	HQ
0	19.46912	NA	8.00e-11	3.638946	3.785211	3.679514
1	310.1694	456.8147	1.73e-15	-2.349376	-1.764316*	-2.187105
2	379.3398	82.34569	1.90e-15	-2.697360*	-1.673504	-2.413386*
3	525.9698	118.7005*	1.07e-16*	-	-	-

Source: Authors' computation

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

Table 4: Bound Test (F-Version) Results

Variables	F-statistics	Critical Values			Lag Option
		Significance	I(0)	I(1)	
F(LnGDP/ LnEDU, LnHEA,	12.87	10%	2.238	3.461	(3,3,1,2,3,2,3,2)
LnTRA, LnAGRI, LnOTE,		5%	2.643	4.004	
LnM2, LnOT)		1%	3595	5.225	

Source: Author's calculation.

In the Table 4, if calculated F-statistic for the model is higher than the upper bound critical value at one percent level of significance, the null hypothesis of no co-integration is rejected, implying that the long-run relationship among the variables under the study has existed.

Table 5: Long-run Coefficients from ARDL (3, 3, 1, 2, 3, 2, 3, 2) Model

Variables	Dependent Variable: LnRGDP			
	Coefficients	Standard Error	T-Ratio	[Prob.]
LnEDU	0.5805**	0.2259	2.5709	[0.021]
LnHEA	-0.0578**	0.0230	- 2.5092	[0.024]
LnTRA	0.0532	0.0445	1.1958	[0.250]
LnAGRI	-0.1006*	0.0288	- 3.4908	[0.003]
LnOTE	0.5018**	0.2441	2.0558	[0.058]
LnM2	-0.1748	0.2702	- 0.6471	[0.527]
LnOT	0.0642	0.1221	0.5261	[0.606]
C	5.1043	1.7475	2.9210	[0.011]
R-Squared = 0.9998; Adjusted R-Squared = 0.9997; D-W Statistic = 2.05; F-Statistic= 5412.58 [0.000]				

Source: Author's calculation

Note: * and ** denote the coefficients at 1 and 5 percent level of significance.

Table 5 reports the long-run coefficients of the model. The coefficients of LnEDU and LnOTE are significant and positive whereas the coefficients of LnHEA and LnAGRI are significant but negative. Quantitatively, one percent increase in government expenditure on education leads to an increase in GDP by 0.5860 percent in the long-run; one percent increase in LnHEA decreases the GDP by 0.058 percent in the long-run; one percent increase in LnHEA leads to 0.058 percent decrease in GDP in the long-run. Here, the impact of educational expenditure on GDP is greater than the impact of agriculture expenditure, health expenditure, and expenditure on other sectors of the government on GDP. However, LnTRA, LnM_2, and LnOT are insignificant in this study.

The positive and significant relationship of education and GDP in the long-run is consistent with the findings of Mallick, Das, and Pradhan (2016); Maitra and Mukhopadhyay (2012); Mudaki and Masaviru (2012) and Muktdair-Al-Mukit (2012) and also supports the Keynesian theory. On the contrary, significant but negative relationship between health expenditure and GDP both in long-run and short-run contrasts the findings of Narayan, Narayan, and Misgra (2010); Maitra and Mukhopadhyay (2012) and Boussalem, Boussalem and Taiba (2014) and also contradicts the Keynesian view. However, health care expenditure did not have an appreciable impact on GDP in the case of Malaysia and the Republic of Korea Maitra and Mukhopadhyay (2012).

The Table 6 presents the result of short-term error correction model for selected ARDL model. The coefficient of the error correction term [ECM (-1)] is negative and statistically significant at 1 percent level of significance. The coefficient - 0.31686 indicates that 31.686 percent of all disequilibria caused by the previous year's shock converges back to the long-run equilibrium in one time period. In other words, every year the deviation is corrected by 31.686 percent.

Table 6: Short-run Coefficients from ARDL (3, 3, 1, 2, 3, 2, 3, 2) Model

Dependent Variable			
Variables	**Coefficients**	**Standard Error**	**T-Ratio [Prob.]**
ΔLnRGDP(-1)	-0.61333*	0.13494	-4.5452 [0.000]
ΔLnRGDP(-2)	-0.38871*	0.13464	-2.8871 [0.009]
ΔLnEDU	0.017223	0.01867	0.9224 [0.366]
ΔLnEDU(-1)	-0.19710*	0.03481	-0.5660 [0.000]
ΔLnEDU(-2)	-0.10041*	0.03063	-3.2778 [0.003]
ΔLnHEA	-0.02255*	0.00526	-4.2867 [0.000]
ΔLnTRA	0.009494	0.01288	0.73682 [0.469]
ΔLnTRA(-1)	0.019085	0.01316	1.4492 [0.161]
ΔLnAGRI	-0.0010699	0.01271	-0.0841 [0.934]
ΔLnAGRI(-1)	0.020854**	0.00946	2.2026 [0.038]
ΔLnAGRI(-2)	0.036756*	0.00998	3.6824 [0.001]
ΔLnOTE	0.093976*	0.02158	4.3546 [0.000]
ΔLnOTE(-1)	-0.085303*	0.02071	-4.1180 [0.000]
ΔLnM2	-0.016385	0.03786	-0.4327 [0.671]
ΔLnM2(-1)	0.04059	0.03443	1.17874 [0.256]

ΔLnM2(-2)	0.19378*	0.03187	6.0796 [0.000]
ΔLnOT	0.020747	0.01831	1.1329 [0.275]
ΔLnOT(-1)	0.16221*	0.02005	8.0902 [0.000]
ECM(-1)	-0.31686*	0.02577	-12.2926 [0.00]
R-Squared: 0.9378; Adj. R-Squared: 0.8841; F-Statistic: 17.46 [0.000]			
ECM = LnRGDP - 0.580*LnEDU - 0.057*LnHEA + 0.053*LnTRA + 0.100*LnAGRI - 0.064*LnOTE - 0.501*LnOT + 0.174*LnM2 - 5.104*C			

Source: Authors' calculation

Note: * and ** denote the coefficients at 1 and 5 percent level of significance.

The coefficient of both the first and second lag value of LnRGDP are negative and statistically significant at 1 percent level of significance. Similarly, the coefficients of the first and second lag value of LnEDU are statistically significant at 1 percent level of significance but do have a negative sign meaning that one percent increase in educational expenditure decreases the real productive capacity of the economy by 0.19 and 0.10 percent respectively in the short-run. Similarly, the coefficient of health expenditure is significant at 1 percent level of significance but has a negative sign indicating that 1 percent increase in health expenditure leads to a fall in real GDP by 0.02 percent in the short-run.

On the same note, the coefficient of first and second lag value of LnAGRI are significant and positive explaining that one percent increase in agriculture expenditure leads to increase in the real GDP by 0.02 and 0.03 percent respectively in the short-run. Again, the first lag value of LnOTE is significant at 1 percent level of significance with the coefficient 0.16221 indicating that a percentage increase in OTE leads to an increase in RGDP by 0.16 percent in the short-run.

Lastly, the second lag value of LnM_2 and first lag value of LnOT are positive and significant at one percent level of significance which are 0.1937 and 0.1622 indicates that one percent increase in broad money supply and openness of trade increases the real GDP by 0.19 and 0.16 percent in the short-run.

Table 7: Diagnostic Test Results

Test Statistics	LM-Version	F-Version
A: Serial Correlation	CHSQ(1) = 0.107 [0.7434]	F(1,14) = 0.035 [0.8526]
B: Functional Form	CHSQ(1) = 0.536 [0.6002]	F(1,14) = 0.287 [0.6002]
C: Normality	CHSQ(2) = 1.877 [0.3911]	Not applicable
D: Heteroscedasticity	CHSQ(1) = 4.620 [0.5092]	F(1,40)= 0.863 [0.6407]

Source: Authors' calculation

Note: A: Lagrange multiplier test of residual serial correlation;

B: Ramsey's RESET test using the square of the fitted values;

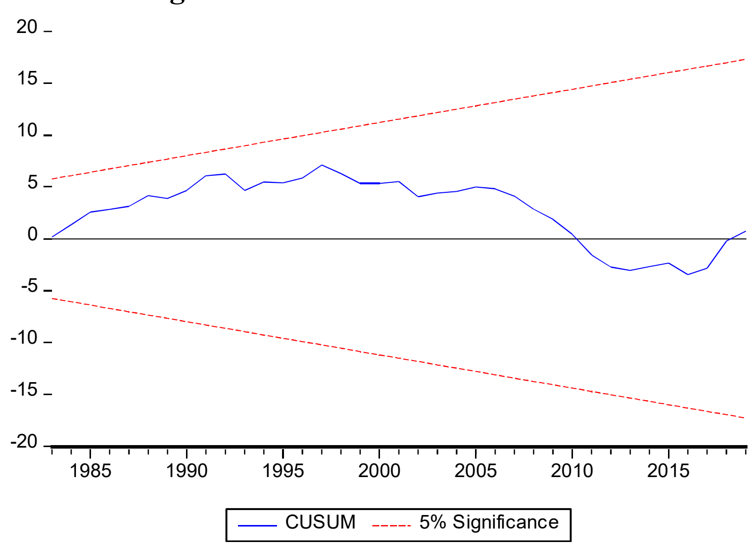
C: Based on a test of skewness and kurtosis of residuals;

D: Based on the regression of squared residuals on squared fitted values.

Table 7 includes the results of the diagnostic test which indicates that the model passes all the tests. Since both LM and F version reveals the p-values more than 5 percent level the null hypothesis of the normality of residuals, no first-order serial correlation, no heteroscedasticity, and no misspecification of functional form are accepted. This confirms that our model is free from serial correlation, heteroscedasticity, functional form misspecification, and the issue of normality.

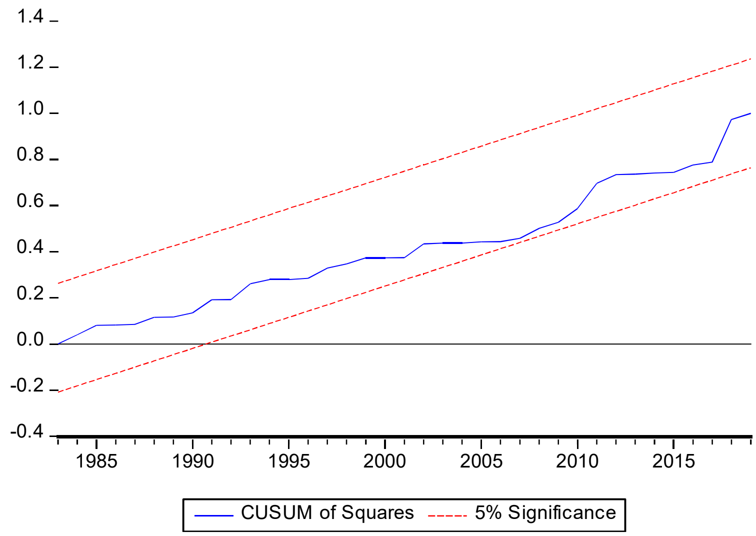
CUSUM and CUSUMSQ test are applied to test the stability of the model. Figure-1 and Figure-2 show the graphical representation of the CUSUM and CUSUMSQ plots respectively. If these statistics stay inside the critical bounds of five percent level of significance indicated by pair of straight lines, the null hypothesis that coefficients are consistent cannot be rejected. The null hypothesis can be rejected at five percent level of significance if either of the line crosses the pair of straight lines. Since, both of the plots lies between the critical regions at 5 percent level of significance, the model is stable indicating no evidence of any structural instability.

Figure 1: Plot of CUSUM Statistics



Source: Author's calculation

Figure 2: Plot of CUSUMSQ Statistics



Source: Author's calculation

Conclusion

This study investigates the impact of government expenditure on health, education, transportation, and agriculture in the economic growth of Nepal. The education expenditure is found to have a significant and positive impact on GDP in the long run. This implies the rational decision of the government to prioritize education in its annual fiscal policy. However, in the short- run the impact is significant but negative. In this regard, micro-level disaggregation of expenditure is required to examine whether government is really spending on practical and skill-based education and channel of education expenditure need to be properly inspected. Similarly, the health expenditure has a significant but negative effect on economic growth both in long-run and short-run. Here, the negative impact of public spending on health to economic growth is not necessarily a reason to reallocate health investment away from the health sector. The improvement in the health status will be worth the effort even if they turn out to have a negative effect on growth. Further, the negative relationship between the health expenditure and the GDP can be linked to welfare economics. The spending in the health sector can be considered as an investment that takes a longer period to show the impact on an economy.

Again, relationship between agriculture spending and GDP in the long-run is found to be significant and negative but significantly positive in the sort-run. This may be due to inadequate investment and inefficiencies, slow adoption of technologies, poor mechanization, and corruption and embezzlements in these sector might have led the contradict results. Despite adverse findings, it becomes increasingly essential to explore the channel, pattern and effectiveness of expenditure to find out optimal potential of these expenditures to enhance economic growth that guarantee educated, skilled, and healthy manpower along with national food security of the country.

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Appendices

Appendix-I: Data Sets Used in the Study

Year	RGDP	EDU	HEA	TRA	AGRI	OTE	M2	OT
1975	143079.62	1329.01	757.59	3266.50	843.77	6850.17	17792.52	140.39
1976	148042.02	1952.45	1076.65	3041.01	1809.46	8405.56	21482.01	154.99
1977	149537.65	2193.74	1082.59	3863.06	1627.78	11399.65	27891.20	158.89
1978	154214.76	2113.06	1077.24	3899.34	1533.78	12287.46	29488.19	139.32
1979	157499.97	1900.63	908.42	3135.17	1229.11	11034.28	27194.79	96.47
1980	155131.16	2196.32	862.98	4534.15	1070.26	14393.69	35112.62	131.74
1981	170692.69	2401.59	1018.27	3987.43	1627.73	16545.45	39428.65	138.19
1982	178222.74	2985.52	1341.79	4509.63	2712.91	19284.84	42893.55	119.19
1983	178948.95	3883.64	1685.73	4513.27	3561.41	23283.84	48796.27	116.49
1984	194692.03	4042.50	1573.79	3971.14	2736.79	24529.51	51808.20	103.65
1985	205170.12	3547.88	1736.07	4334.88	3126.41	24225.64	54154.48	99.10
1986	214537.68	4184.20	1562.44	3015.94	3321.19	25628.35	58351.75	85.77
1987	218184.28	4368.88	1679.84	3662.37	2357.31	27265.18	59780.66	74.34
1988	234977.18	4550.38	1800.54	3979.94	2865.64	29899.66	65454.22	71.45
1989	245146.28	4782.92	2381.16	5418.37	2872.44	33989.02	73060.84	62.94
1990	256508.90	4463.41	1712.44	4260.02	3013.89	35337.19	78261.31	56.32
1991	272839.36	4719.89	1497.36	4758.88	3553.24	38850.31	85481.88	57.65
1992	284047.83	5449.25	1744.53	4806.43	2501.36	35696.99	86780.83	58.02
1993	294974.44	7139.29	1825.16	5148.30	3651.70	35386.65	100328.02	56.65
1994	319219.10	7311.19	105.09	5652.40	3743.54	37008.35	111777.79	56.97
1995	330291.04	7633.88	2253.83	4826.69	4072.75	40075.26	122041.84	55.91
1996	347920.70	8596.51	2396.46	8638.44	3203.81	42219.91	129505.56	52.97
1997	366224.70	9404.16	3272.50	7223.10	2565.02	43757.84	135412.78	54.08
1998	376999.32	9779.34	3916.17	7348.63	2788.35	46491.30	158474.68	48.53
1999	393902.92	8846.34	3241.41	6154.49	2320.33	48051.10	175971.08	41.48
2000	417992.09	10275.00	3801.70	5364.46	2411.10	51144.46	205005.22	45.95
2001	441518.49	11044.69	3519.70	5550.89	2440.70	57279.03	214453.95	38.81
2002	442048.99	12555.95	3710.60	4590.48	2594.22	53589.58	215508.56	32.32
2003	459488.31	12360.79	3409.07	3704.24	1839.89	57104.14	229553.55	33.05
2004	481004.32	12889.15	3556.44	3813.18	1806.81	58087.86	248506.13	31.75
2005	497738.96	14542.24	3954.05	3771.81	1971.58	62369.32	253711.79	29.83
2006	514485.63	15211.87	4561.74	3548.87	2126.03	61774.07	272802.85	28.14
2007	532038.16	15775.54	5412.07	4909.29	3026.61	68540.83	289121.99	25.52

2008	564516.90	18728.91	6831.44	5244.39	4339.26	76526.24	342850.40	23.86
2009	590107.20	21294.15	7862.99	6199.98	2960.41	92844.87	376490.74	21.28
2010	618529.15	24058.20	8685.42	10901.23	10409.82	80610.69	373158.02	18.92
2011	639694.08	25833.70	8869.49	12612.14	10654.89	80251.16	431150.58	15.77
2012	670279.36	27232.15	10036.61	12324.70	11676.88	87574.34	496036.59	15.40
2013	697954.23	25706.70	9006.10	11362.95	11881.16	89719.35	541632.11	15.39
2014	739754.36	29305.54	9985.60	12512.99	15048.13	96968.23	589670.50	15.46
2015	764335.70	28648.30	10573.75	14728.25	16562.31	120220.59	673788.71	14.49
2016	768835.18	30945.51	11604.75	17126.35	18921.39	126484.98	765905.92	12.78
2017	832060.33	33783.42	14111.15	28035.14	23722.01	160824.80	806303.33	12.37
2018	887817.02	13126.30	10473.61	32861.07	20611.90	239948.08	902261.39	12.71
2019	949886.03	7159.59	9886.64	27596.51	13163.87	247158.54	983760.94	12.03

Source: Nepal Rastra Bank and Ministry of Finance