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Economic Analysis of Public Expenditure, Revenue, and Resource Gap in Nepal

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Abstract

The aim of this study is to look at the influence of government spending and revenue on Nepal's government resource gap. The study employed a descriptive and exploratory research design. The secondary data covers 26 years from 1995 to 2020 and was collected from various economic surveys in Nepal. Econometric tools like descriptive statistics, correlation analysis, Augmented–Dickey-Fuller test, unit root testing, regression analysis, and ex-post forecasting are used to explore the prediction of the dependent variable. For model validity, the researchers utilized the LM test and Jarque-Bera test. There is a moderately positive relationship between government expenditure and the resource gap, however, there is a negative impact of government revenue on the government resource gap in Nepal. Government expenditure and income are individually significant in determining the size of the resource gap in Nepal. The value of the root mean squared error is 0.986, which is very small. Therefore, the gap between the actual value and the predicted value is small, and they move together. It is suggested that policymakers increase revenue and manage government expenditure based on ground reality to decrease the resource gap. A government resource gap study can assist policymakers in determining how their present resource levels are assisting them in meeting their objectives. The results, findings, and methods of this study are not affected by what other researchers have found and concluded.

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Keywords: variation, fiscal deficit, root mean squared error, overall deficit, ex-post forecasting

JEL Selection: P43, C32, C53.

Introduction

The discrepancy between public expenditure and government income is known as the resource gap. Every corporate unit, organization, NGO, INGOs, and other economic unis may have a resource deficit. The resource gap compares the actual condition of affairs, such as a market, a product, resources, and so on, to the desired level of performance. A resource gap analysis looks at the disparity between a company's current resources and the needs to meet future demands. A resource gap analysis looks at the existing condition and evaluates the resources it needs. Like business units or economic units, the government also has to face the problem of resource gaps.

There are various types of gaps in the field of the public sector. First, the resource gap is the difference between expenditure and revenue, also known as the fiscal deficit. Second, the difference between expenditure and revenue plus foreign grants is known as the budget deficit. The third type is the total deficit, which is defined as the gap between expenditure and revenue plus foreign aid (grant or loan) plus domestic borrowings. In recent years, Nepal has faced a severe resource shortage. This is owing to the government's outsized expenditure growth in comparison to domestic revenue production. The consequences and causes of macroeconomic instability, as well as the characteristics of low-income economies, are resource gaps (Mohamed, 2017). In the least developed countries, like Nepal, a deficit budget is made and used to get steady growth in output by bringing in more resources for development projects (Mahara & Bhatt, 2019).

Nepalese economy is characterized by three kinds of macroeconomic imbalances: saving-investment, export-import, and revenue-expenditure. These fundamental gaps represent the Nepalese economy's foreign dominance while saving, investment, and revenue-expenditure gaps are mainly a consequence of excess activities in economic matters. To fulfil these gaps, public debt in the form of either internal or external debt is inevitable. The growing pattern of borrowing creates an excellent debt management problem and becomes a major challenge for the country. The borrowed money is unlikely to be spent on the non-monetized and unproductive sectors of the economy, which bear the burden of the country (Silwal, 2017).

The revenue received by the government from various types of taxes or multiple sources of non-tax revenue during a year is called public revenue. The public authority can receive income from various sources such as taxes levied on income, property of individuals and corporations and the goods and services produced, exports and imports, non-taxable sources

such as government-owned enterprises, fees, fines, natural resources escheats, betterment levy, and among other (Acharya, 2017).

The Nepalese government's ability to maintain service delivery and impose fiscal discipline, particularly at the local level, continues to be a key problem (WB, 2019). The resource gap is a significant problem at all levels of the government of Nepal. Taxes provide a long-term financial platform for sustainable development. Taxes are the lifeblood of state service, and taxes matter for effective state-building. But in developing countries, the collection of tax revenue is a challenging issue. People want to see the government in every field without paying any tax.

In developing countries, people have a low capacity to pay taxes. Developing countries seek government presence in every field, even in small and unnecessary areas, without paying any tax. There may be different causes behind it, such as corruption, slow service delivery systems, misuse of resources, and problems with selection of priority. There is a high gap between revenue and expenditure. As a result, the Nepalese budgetary framework has become increasingly reliant on foreign and domestic borrowing. The quantity of money invested in development activities determines a country's economic growth. When the Nepalese budget is examined, it is found that development spending is declining while routine expenditure is increasing. The issue has reached a critical point where Nepal can nearly fulfill its regular expenses from internal revenue sources (Shumshere, 2009). The resource gap of many countries has increased due to the hit of COVID-19 on the economy (Srivastava, 2021). So, the resource gap due to the huge difference in income and expenditure will further rise in Nepal.

This study is devoted to the economic analysis of government expenditure, revenue, and resource gaps. Furthermore, it examines the association between public spending and revenue. For example, the government increases expenditure based on the increase in government revenue.

The remaining portion of the article is structured as follows: The current literature is summarized in Section 2. Section 3 is concerned with the general research strategy; Section 4 is concerned with the empirical findings, and Section 5 is concerned with the study's conclusion and consequences.

Literature Review

In developing nations like Nepal, resource scarcity is a prevalent issue. There are just a few studies on the resource gap, particularly on government revenue and spending. Haavelmo (1945) showed the multiplier effect of a balanced budget expansion on aggregate demand and output. In the modern capitalistic economy, the theory of an unbalanced budget has a significant role in pacing economic development. Keynes (1936) suggested formulating an unbalanced budget to smooth the economy's run and generate more employment opportunities.

The classical economists were in favor of a balanced budget. A resource gap or a fiscal gap can be found in an unbalanced budget.

There are many opinions on the size of government expenditure. The German writer Lorenz Von Stein states that the state economy may be good because of more and wrong because of small expenditure. The classical economist, for example, J. B. devised the idea that the best of all financial strategies is to spend little (Colm, 1936).

Classical economists favored a balanced budget annually. Among the classical scholars, there were two divergent opinions regarding the interpretation of the balanced budget. One view relates to a balanced budget with total expenditures and revenues; there should be no government borrowings (Lewis, 1952). Keynes, Hansen, Lerner, Dalton, and Beveridge argued that budgetary policy should aim at attaining the optimum level of employment of resources and steady growth of the economy. For this, they advocate a managed approach to budgeting as per the economy's needs—the modern approach of a budgetary theory developed with the current interest in the problems of economic cycles. The modern system holds that the government should not be worried about balancing the budget annually. It may be suspended over the entire period of the business cycle. Thus, during a period of depression or recession, a deficit budget is desirable (Smithies, 1964).

Shibly and Thirlwall (1981) analyzed the dual gap in Sudan. Domestic saving-investment and foreign exchange gaps were approximately 50% higher than envisaged for the target growth rate of only 7.5% to be achieved. Similarly, Boadway and Keen (1994) observed the increasing trend of the fiscal gap in developing countries and found that it negatively impacted the economy in the long run. In addition, Sandrina (2005) examined the borrowing gap and the effectiveness of borrowing in the growth of developing countries. The conclusion was that foreign borrowing was beneficial to economic growth in developing countries.

Karras (2006) investigated the correlation between the increase in government expenditure and the resource gap using annual data from 1960 to 1997 for a sample of 71 developing countries, and the study concludes that the expense of developing countries has been increasing in more proportion than the increase in revenue of the country. Foreign aid and borrowing have a positive, permanent, and statistically significant impact on economic growth. The permanent increase in foreign aid by 20 USD per person resulted in a permanent increase in the development of real GDP by 0.16 percent. Fluharty and Scaggs (2007) stated that the resource gap is the central economic problem of government budgeting and resource mobilization.

Bhattarai (2013) observed the prevailing resource gap in the Nepalese economy. The resource gap also increased with the increase in the budget size during 1975/76- 2010/11. In this period, the average resource gap grew by 18.86%.

Samuel and Xicang (2013) studied the effects of government expenditure and borrowing on economic growth in Ghana. They found a more consistent resource gap than the change in spending and government revenue. These studies emphasized the role of public borrowing in economic growth and increased the size of the nation's budget. More studies are related to public borrowing and foreign aid that fill the resource gap of the government.

Mohamed (2017) investigated the contribution of foreign capital inflows to abridging. The resource gap and economic growth of Sudan throughout 1978–2015. The study found a long-run relationship among economic growth, resource gaps, and foreign capital inflows. The resource gap was widening between government expenditure and revenue.

Dahal (2018) observed the net lending gap, resource gap, and associations between public income and expenditure during 2001/02–2015/16. It was found that there was a moderate degree of a positive relationship between general income and expenditure. The net lending gap changed over time instead of following a steady trend, and the resource gap grew in different ways.

All of these studies are about the state of the resource gap or the economic impact of the resource gap. In the budget deficit, various studies may be found. However, this study is focused on the resource gap, which has received little attention. The essential component is that it investigates the relationship between government spending and revenue and their impact on the resource gap. It responds to what makes up the wide range of resource gaps in developing countries like Nepal.

Research Methods and Materials

Variables Specification

The government's expenditure, government revenue, and resource gap are taken as variables under the study. It is assumed that the resource gap depends upon government revenue and government expenditure. The resource gap is positively related to government expenditure and negatively related to government revenue. The resource gap is the dependent variable, and government revenue and expenditure are independent variables. This study is based on secondary data that has been collected from various economic surveys in Nepal.

Research Design

This study is based on a descriptive and exploratory research design. The outcomes of mathematical calculations are analyzed to draw conclusions. It covers 26 years of data from 1995 to 2020. The year 1995 indicates the fiscal year 1994/95 and so on. Ex-post forecasting is used to predict the dependent variable.

Model Specification

This study used Cobb- Douglas production as the theoretical framework. Depending upon the assumptions of two inputs labor and capital are used in the line of production, the Cobb- Douglas production function is:

The Cobb- Douglas Production function (Y_t) = $AK^{\alpha}L^{\beta}$ (1)

Where Y_t is actual output and L and K are inputs of labour and capital, respectively. A, α, and β are positive parameters where $\alpha > 0$, $\beta > 0$. α, and β are the output elasticity of capital and labour, respectively. The sum of α and β is always one, i.e., $\alpha + \beta = 1$. These values are constants determined by available technology. The equation tells that output depends directly on L and K, and that part of the output that L and K cannot explain is explained by A, which is the 'residual,' often called technical change. The higher the value of A, the higher the output level that any particular combination of the inputs can produce.

The resource gap depends upon the size of government expenditure and government revenue. In this sense,

GNRS = f (GNE, GNR) (2)

GNE represents government expenditure, GNR stands for government revenue, and GNRS denotes the government resource gap. The static regression model:

$LNGNRS = \beta_0 + \beta_1 LNGNE + \beta_2 LNGNR + \mu_t$ (3)

In equation (3), β_0 indicates the intercept of the regression line. β_1 and β_2 show the coefficient of respective variables. μ_t is the error correction term of the equation. In the dynamic model, the lagged values of dependent variables are entered as repressors (Gujarati, 1995). The dynamic regression model is specified as:

$LNGNRS = \beta_0 + \beta_1 LNGNRS(-1) + \beta_2 LNGNE + \beta_3 LNGNR + \mu_t$ (4)

LNGNRS (-1) stands for the autoregressive variable of LNGNRS, and it is lag one variable of government resource gap treated as the independent variable.

Results and Discussion

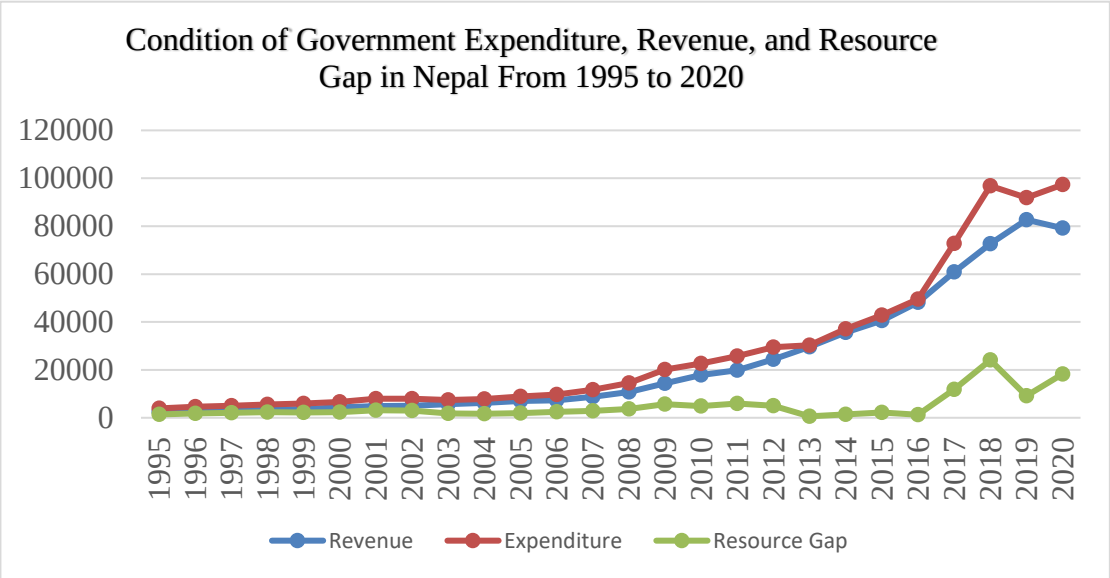
Condition of Variables

Developing countries face the problem of resource gaps in the revenue and expenditure administration of the economy. The government has to spend more to meet the unlimited ambitions of the general public. People seek government in every field of society, but the government has a limited source of income. So, there may be a wide gap between the income and expenditure of the government. The same condition can be seen in the Nepalese economy. The government's income, expense, and resource gap have been increasing from 1995 to 2020,

but more fluctuation in the last five years can be seen. The government's expenditure ranges from 3906 to 97323.36, government revenue ranges from 2460.51 to 82676.38, and the resource gap ranges from 1445.49 to 24091.84 ten million rupees during the study period from 1995 to 2020 in Nepal. The condition of government expenditure, revenue, and resource gap is presented in the following figures: 1.

Figure 1

Condition of government expenditure, revenue, and resource gap



Notes: Economic Survey of Nepal 2000/01 (GoN, 2001), 2008/09 (GoN, 2009). 2020/21 (GoN, 2021).

Descriptive Statistics

Descriptive statistics help to describe and understand the features of the data set. All descriptive statistics are either measures of central tendency or measures of variability. Descriptive statistics are used to describe the basic features of the data that are used in the study. According to descriptive statistics, the standard deviation of the resource gaps is smaller than government expenditure and revenue. So, the mean value of the resource gap is more representative than other variables. The distribution of the resource gap is leptokurtic, and other variables like government expenditure and revenue are also leptokurtic. The coefficient of variation of government expenditure is smaller (10.57%) than another variable. So, it is more consistent or less variable in comparison to another variable. The coefficient of variation of government revenue is higher (12.24%) than other variables. So, it is more variable than other variables. The outcomes of the descriptive statistics of variables are given in table 1.

Table 1

Descriptive Statistics of variables

Description	LNGNRG	LNGNR	LNGNE
Mean	8.052	9.433	9.720
Median	7.777	9.180	9.473
Maximum	10.089	11.322	11.485
Minimum	6.402	7.808	8.270
Std. Dev.	0.851	1.155	1.027
Skewness	0.715	0.266	0.382
Kurtosis	3.236	1.696	1.842
Coefficient of Variation	10.58%	12.24%	10.57%
Jarque-Bera	2.280	2.149	2.084
Probability	0.319	0.341	0.353
Sum	209.359	245.283	252.729
Sum Sq. Dev.	18.145	33.331	26.372
Observations	26	26	26

Note. Authors calculation by using Eviews11 in 2021

Where LNGNRG= Government resource gap after taking the log.
LNGNR = Government revenue after taking the log.
LNGNE = Government expenditure after taking the log.

Correlation between Variables

The correlation coefficient shows the degree of association between the pair of variables. The correlation between the resource gap and government revenue is 0.531. It indicates a moderate degree of positive association between the resource gap and government revenue. Similarly, there is also a reasonable degree of a positive relationship between the government's resource gap and government expenditure. Likewise, there is a high degree (0.996) of positive associations between government revenue and spending. Usually, the resource gap must be declared with the increase in government revenue. However, such relationships do not exist in the Nepalese economy. The correlation coefficients between pairs of variables are presented in Table 2.

Table 2

Associations between pairs of variables

	LNGNRG	LNGNR	LNGNE
LNGNRG	1	0.531	0.594
LNGNR	0.531	1	0.996
LNGNE	0.594	0.996	1

Source: - Authors calculation by using Eviews11 in 2021

Measurement of the Relationships among Variables

The ordinary least square method of regression analysis is used to measure the relationship and impact between variables. To run the regression model, it is necessary to check the stationary or non-stationary data. It is also essential to identify the optimal lag length. Before running the regression model, the processes of lag selection and unit root testing are performed.

Lag Selection

The lag length is how many terms back in the autoregressive process we test for serial correlation. Lag length represents the influence period of one variable to another or itself. There are various criteria to determine the lag length of variables. All standards like Sequential Modified LR test static, Final Prediction Error (FPE), Akaike Information Criteria (AIC), Schwarz Information Criteria (SIC), and Hannan-Quinn Information Criteria (HQI) indicate one as the optimum lag. Recall that the asterisks (*) indicate the lag order selected by the criteria. The outcomes of different lag selection criteria are presented in table 3.

Table 3

The suggestion of lag selection by different criteria.

VAR Lag Order Selection Criteria
Endogenous variables: LNGNRG LNGNE LNGNR
Exogenous variables: C
Sample: 1995 2020
Included observations: 26

Lag	Log L	LR	FPE	AIC	SC	HQ
0	-24.791	NA	0.002	2.138	2.283	2.179
1	53.084	131.790*	8.58e-06*	-3.160*	-2.579*	-2.993*
2	58.962	8.592	1.13e-05	-2.920	-1.904	-2.628

* Indicates lag order selected by the criterion

Note. Authors calculation by using Eviews11 in 2021

Unit Root Testing

Unit root test check the data is predictable or not. If the time series data has a unit root, it has no predictive power. To check the predictable control of the data, the Augmented Dickey-Fuller (ADF) test is used. The data of all three variables like government revenue, expenditure, and resource gap are stationary in the first difference. In the first difference, the P-values are less than 0.05, and the absolute value of ADF is more than the absolute value of t-statistics at 5 level of significance. The first difference in both intercept and trend and intercept from the P-value is less than 0.05. As a result, we can rule out the null hypothesis that they have a unit root. At the level form, the probability value of variables is more than 0.05. So, we cannot

reject the null hypothesis. Therefore, they have a unit root. It means, at level form, the data is unpredictable. The outcomes of the ADF test are listed in table 4.

Table 4

Results of Augmented Dickey-Fuller Test (ADF) Null hypothesis: They have a unit root.

Series name	Description	Level		First Difference	
		Intercept	Trend & intercept	Intercept	Trend & intercept
LNGNE	t- value	-2.936	-3.529	-2.939	-3.529
	ADF test	-0.726	-2.581	-4.615	-4.574
	P-value	0.828	0.290	0.0006	0.0039
LNGNR	t-value	-2.936	-3.529	-2.939	-3.529
	ADF test	-0.494	-1.851	-4.818	-4.742
	P-value	0.881	0.660	0.0003	0.0025
LNGNRG	t- value	-2.936	-3.526	-2.939	-3.529
	ADF test	-1.748	-3.229	-7.137	-7.038
	P-value	0.4001	0.093	0.000	0.000

Note. Authors Calculation by using EViews11.

Impact of Government Expenditure and Revenue on Resource Gap

Three variables are interconnected: government revenue, expense, and resource gap. The general conclusion is that the resource gap depends upon government expenditure as well as government revenue. If government expenditure increases without any increase in revenue, there will be a high resource gap between income and spending. But the resource gap decreases with the increase in government revenue when government expenditure remains unchanged. Government expenditure is significant enough to determine and explain the resource gap of the government. Likewise, government revenue is also significant in deciding on the resource gap. More than 50% of independent variables have a P-value less than 0.05. The government's revenue and expenditure are individually marked to explain the resource gap. Therefore, this model is close to reality. The value of R square is 0.996, or 99.6%, which is more than 60%. It indicates that independent variables are nicely fitted. The probability value of F-statistics is 0.000, which is less than the 5% level of significance, i.e., 0.05. Therefore, independent variables have a combined effect in determining the size of the resource gap. It proves that government revenue and expenditure determine the resource gap of the government of Nepal. The impact of independent variables on the dependent variable is presented in table 5.

Table 5

Measurement of impact and relation

Dependent Variable: LNGNRG

Method: Least Squares

Sample: 1995 2010

Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.289	0.207	-11.333	0.000
LNGNR	-2.325	0.096	-24.181	0.000
LNGNE	3.339	0.1223	27.287	0.000
LNGNRG (-1)	0.009	0.037	0.268	0.792

R-Squared	0.996	Adjusted R-squared	0,996
S.E. of regression	0.028	Durbin-Watson stat.	1.717
F- Statistic	952.524	Probability (F-statistic)	0.000

Serial correlation P- value of observed R square = 0.232

Heteroscedasticity (P- value of chi square) =0.456

Jarque-Bera Normality (p value) = 0.444

Note: Authors Calculation by using EViews11.

Depending upon table 4, the regression line can be developed:

LNGNRS = -2.2892- 2.3248LNGNR +3.3396LNGNE +0.0099LNGNRG (-1) (5)

According to the diagnostic checking results, the probability value of the observed R square is more than 5% (0.05) which is 23.2% (0.232). So, there is no problem with serial correlation. In the result of the heteroscedasticity test, the chi-square p-value is 0.456, which is more than 0.05. It confirms the absence of heteroscedasticity. The P-value of the normality-LM test is found at 0.444, which is also more than 0.05. It ensures that residuals are not normally distributed. The CUSUM and CUSUM square test guarantees the stability of this model. Those are represented in Figures 2 and 3, respectively. All the parameters of diagnostic checking ensure the reliability of this model. So, this model can be used in forecasting.

Figure 2

CUSUM Test

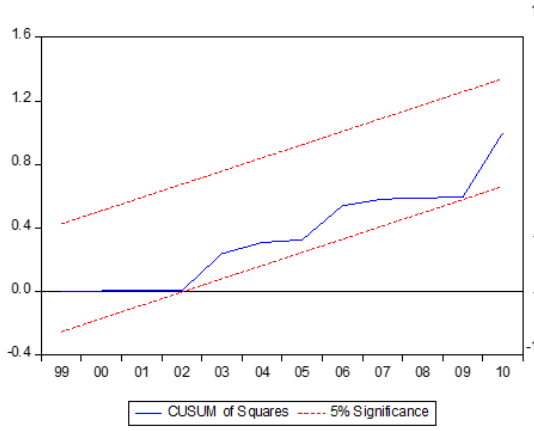
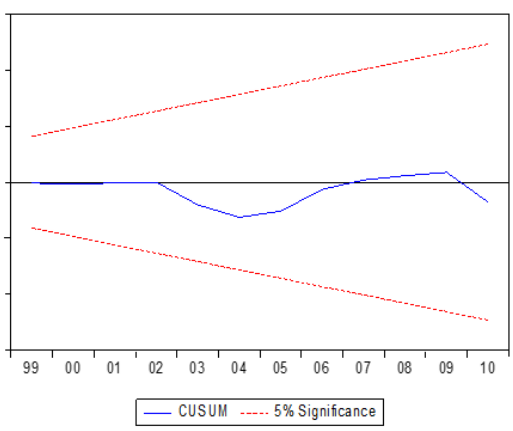


Figure 3

CUSUM Square



Forecasting of resource gap

The resource gap is the difference between government annual expenditure and revenue. All the diagnostic results of the regression analysis suggest that there is no problem with using this model in forecasting. The ex-post forecasting of the dependent variable, i.e., the resource gap from 2011 to 2020, is presented in figure 4.

Figure 4

Forecasting of the dependent variable

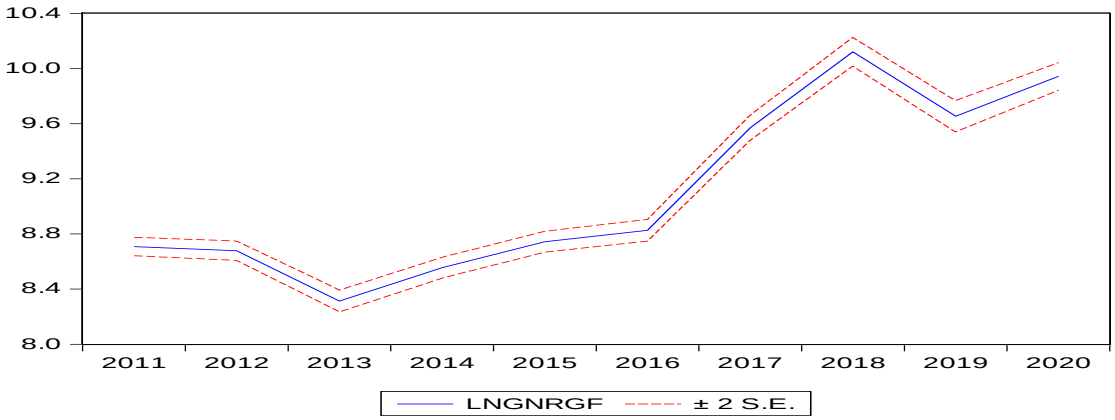


Figure 4 represents the ex-post forecasting of the resource gap of the government of Nepal. The blue line (middle line) is the forecasted line of the resource gap from 2011 to 2020. It has passed between two red lines (boundary lines), i.e., passing through the 95% confidence interval. It means our forecasting is good and it has good predicting power. The best benchmark

for determining forecasting capacity is the root mean squared error. The value of the root means squared error is 0.9858, which is small. Therefore, the forecasted resource gap (LNGNRGF) and actual resource gap (LNGNRG) are moving closer. The root means squared error (RMSE) is the difference between predicted and actual values, i.e., RMSE = Actual value – Forecasted value. Figure 5 shows the difference between the real resource gap and the predicted resource gap.

Figure 5

The gap between actual and forecasted resource gap

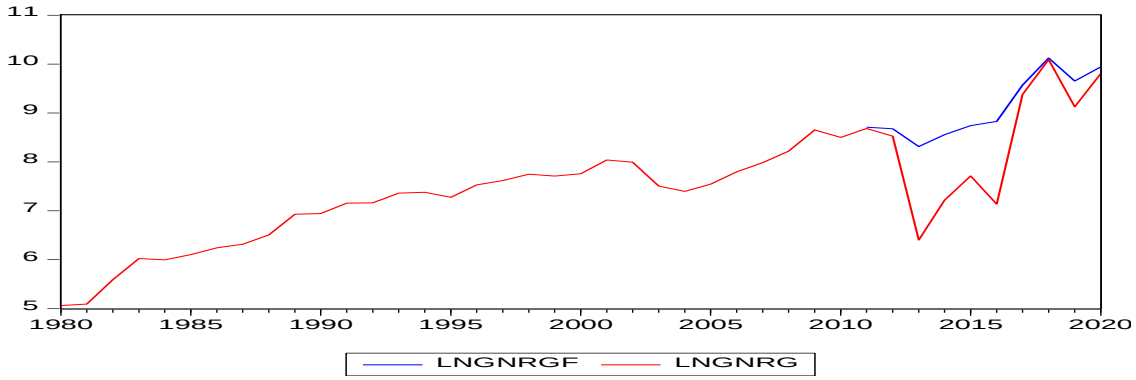


Figure 5 shows the gap between the actual resource gap and the forecasted resource gap of Nepal from 2011 to 2020. The blue line (shorter one) and the red line (the longer one) represent the predicted and actual resource gap. The red and blue stripes are moving together. It means the calculated value of the resource gap is close to the existing resource gap in Nepal.

Conclusion, Limitation and Policy Implication

The resource gap is a common problem in the Nepalese economy. The resource gap in Nepal is increasing, with some fluctuation in the last five years. The variability of the resource gap was 10.58% during the study period. Government expenditure is consistently growing, creating a wide resource gap. The government's expenditure and resource gap have a moderately positive relationship. Government expenditure and revenue are individually significant in determining the size of the resource gap in Nepal.

Similarly, government expenditure and revenue have a combined effect in determining the resource gap. The resources have decreased with the increase in government revenue. Government revenue has a negative impact, and government expenditure has a positive effect on determining the size of the resource gap. The mean squared error is so tiny. So, the difference between the forecasted value and the actual value is also slight, i.e., moving closer.

The government expenditure of Nepal is not managed based on received resources. The high resource gap has a long-run negative impact on the economy. So, government revenue

must be increased to reduce the resource gap. A resource gap analysis is particularly useful to policymakers to examine how their current resource levels are helping them to meet their goals.

This study is based on secondary data covering 26 years from 1995 to 2020. The year 1995 indicates the fiscal year 1994/95, and others are also converted in the same manner. It uses 16 years of data from 1995 to 2010 in the system equation and ten years of data from 2011 to 2020 for ex-post forecasting. It analyzes only two determinants, like government expenditure and revenue, of the resource gap. Its focus is on the relationship and impact of government expenditure and income on the resource gap and ex-post forecasting of the resource gap in Nepal. So, it is important to look into the different research gaps by using other data, methods, and tools.

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