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Infrastructure Development and Economic Growth in Nepal

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Abstract

This article, on infrastructure development and economic growth in Nepal, focuses on the infrastructure development that seems to affect economic growth in Nepal during the study period 1994-2018. To investigate the casual relationship between infrastructure development and the economic growth, this study has employed Engel-Granger cointegration test and Error Correction Mechanism (ECM) model. The results showed a cointegration and a stable relationship between gross domestic product and infrastructure variables—such as total length of road, percentage of economically active population, percentage of tertiary education enrollment, and gross capital formation. In addition, the coefficient of Error Correction term was -0.88—signifying about 88 percent adjustments towards equilibrium, confirmed by the occurrence of a stable long-run relationship among the variables. The sign of Error correction term (Ect) became negative and statistically significant at the 1 percent level, indicating the possibility of convergence towards equilibrium in each period with adjustment captured by difference terms. This study has its implication for policymakers to raise economic growth through infrastructure development. The expansion of infrastructure network leads to the enhancement of efficiency and competitive market, and the acceleration of the economic growth within the country.

Keywords: gross domestic product, infrastructures, human capital, unit root, cointegration, error correction term.

Introduction

Nepal, a developing country, has been facing the problems of low development of infrastructure—as well as a low volume of gross domestic product (GDP). Infrastructure development plays a vital role in economic development of any country. Sound infrastructure of a country leads to higher and stable economic growth, and the high economic growth helps to develop the infrastructure of the country. Thus, it has long been recognized that the sufficient development of infrastructure service is essential to raise the production and productivity of the country. With the transformation of an economy from public sectors to private-sector involvement after the liberalization, the infrastructure development leads to high economic growth in industrial countries (Calderon & Serven, 2003). More investment in the infrastructure development tends to boost output, private investment, and employment,

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economic activities, public capital, economic performance, and growth of a nation (Munnel & Cook, 1990).

The developed countries are developed thanks to the sufficient development of their basic infrastructures, such as electricity, transportation, communication, railways, human capital, airplane, and pure drinking water facilities—the vital components of economic growth of a nation. The development of infrastructure is crucial for trade liberalization—and efficient allocation and utilization of various resources. Thus, developed countries are advanced because of their trade liberalization through the infrastructural development, whereas developing countries are under developed due to the insufficient development of infrastructure.

The development of infrastructures helps to integrate the country with global markets and to connect the world with low cost. Infrastructure services are necessary to raise production and productivity in business by minimizing production and transport costs. Furthermore, the infrastructures help in economies of scale in business operations by reducing various costs, connecting different regions and countries, enhancing competitive power, and improving market access at low costs.

The well-developed infrastructure plays a key role in accelerating economic activities and boosting economic growth of the nation. The expansion of transportation, communication, energy (electricity), water facility, skilled human capital, and capital markets spurs infrastructure development, thereby accelerating the economic growth.

Nepal has not yet fully developed the infrastructure to boost the rapid economic growth. The policy makers of Nepalese government seem unable to formulate effective policies about infrastructure development for the targeted economic growth. Against this backdrop, it is necessary to explore how far infrastructure development affects economic growth in Nepal. Thus, the objective of this paper is to examine the relationship between infrastructure development and economic growth in Nepal. The rest of the study is organized as follows. The second section provides a review of selected literature. The third section specifies a method of a conventional growth model, incorporating infrastructure development as one of the sources of GDP. The fourth section presents the estimated result based on Angel Granger approach to co-integration and Vector Error Correction model. The last section draws the conclusion from the study.

Review of Literature

A large number of empirical literatures (Aschauer, 1989; Baltagi & Pinnoi, 1995; Calderon & Chong, 2009; Cashin, 1995; World Bank, 1994) have focused on the study of the nexus between infrastructure development and its impact on economic growth. Thus, each source has a specific impact on promoting GDP growth.

Gramlich (1994) explored the importance of infrastructure on economic growth in United State of America (USA). This study used time series data to examine the impact of infrastructure on economic growth of USA during a period of 1949 – 1991. Cob Douglas production function was used to measure the impact of infrastructure on economic growth. This study employed the transportation, communication, human capital, education institution and access of pure drinking water as explanatory variables, whereas the production of output through capital and labour was the dependent variable. The regression results found the positive relationship between availability of infrastructure and economic growth in USA.

Bougheas, Demetriades, and Mamuneas (2000) conducted their studies on infrastructure specialization and economic growth, using panel data of 119 countries for the period of 1960-1989. The study employed growth regressions and OLS techniques, considering physical infrastructure stock (telephone main lines and length of roads) and human capital (secondary school enrolment rate). The regression analysis found that there was a positive and significant relationship between infrastructure development and long-run economic growth of the nation. Finally, the study concluded a positive and statistically significant impact of secondary school enrolment rate on economic growth.

Demurger (2001) examined the links between infrastructure development and economic growth in China. This study used the panel data of 24 province of China during the period of 1995 – 1998. Two-stage least squares analysis was employed to investigate the relationship between infrastructure development and GDP per capita growth in China. Transportation (railway, highway, and waterway), telecommunication, and electricity production were the proxy for infrastructure development, and GDP per capita was the proxy for economic growth of Chinese economy. Geographical constant and availability of human capital were also used to control the regression model. This study found that urban provinces were more developed than the rural ones owing to the less development of infrastructure in rural areas. The relationship between transportation infrastructure and economic growth is based on the endowment of transportation, density, quality, and accessibility of transportation. Furthermore, the impact of infrastructure on economic growth was nonlinear and concave. The positive impact of transportation was diminishing with its development and a rise in poor provinces. This study concluded with a positive and statistically significant relationship between infrastructure development and economic growth in China.

Mastromacro and Weitek (2006) assessed public infrastructure investment and their effect on efficiency in Italian regions. This study used a stochastic frontier model to analyze physical public capital stock (core infrastructure such as transport, electricity and communication) and non-core infrastructure (hospitals, public buildings, reclaimed land and others), considering 20 regions for the study period of 1970-1995 to analyze the efficiency in output. The findings of the study reveals that overall public capital was directly associated with the technical efficiency. The study has concluded that the core infrastructure indicators positively stimulate the efficiency, whereas non-core infrastructure revealed mixed results.

Herranz-Loncan (2007) examined the volume of investment on infrastructure development and its impact on economic growth in Span. This study employed time-series data for the period of 1850-1935 to explore the relationship between gross investment on infrastructure and economic growth in Span. This study used production function, co-integration, and vector auto-regressive (VAR) model, considering aggregate and disaggregated physical infrastructure capital stock (communication networks and transport) to predict economic growth of the nation. The cointegration results found the long- and short-run relationship between gross investment in local scope infrastructure and economic growth. The relationship was positive and statistically significant. Moreover, this paper concluded that returns to investment in large nation-wide networks were not statistically significant different from zero during the study periods.

Sahoo and Dash (2009) analyzed the impact of infrastructure on economic growth in India. Time-series data was used to explore the role of infrastructure in economic growth in India during the period of 1970-2006. This paper developed the index of infrastructure and estimated the growth equation. In the growth equation, GDP was the dependent variable, but per capita electricity power consumption and per capita energy use (kg of oil equivalent)—as well as telephone line (both fixed and mobile) per 1000 population rail density per 1000 population, air transport, freight million tons per kilometer, and paved road as percentage of total road—were the independent variables. Causality analysis found that infrastructure development to make a positive and significant impact on economic growth in India. Furthermore, this study found the a unidirectional causality between infrastructure development and output growth.

Pradhan (2010) explored the relationship between infrastructure and economic growth in India. This study used the time-series data to explore the impact of infrastructure stock on gross domestic product during the period of 1970 – 2006. In cointegration analysis, transport infrastructure (road and rail), energy consumption (oil and electricity) were used as explanatory variables, and gross domestic product as a dependent variable. This study found a unidirectional causality between infrastructure stock and GDP growth in India.

Srinivasu and Rao (2013) stated that infrastructure was a prerequisite for economic development of the nation. Transportation and communications, energy, pure drinking water supply, health, housing, and educational facilities are the basic needs for human existence. The main objective of this study was to explore the role of infrastructure on economic growth in India. The descriptive analysis found that infrastructure has been playing an important role in promoting growth—and in alleviating poverty, reducing disparity, and raising the health and education facilities within the country. Similarly, communication facilities help to raise the sanitation and learn to use appropriate technique and technology in the production sector that also raises the output growth within economy.

Soto and Bustillo (2014) examined the relationship between infrastructure investment and economic growth in the Mexican urban areas. This study used the time-series data to explore the impact of infrastructure investment on economic growth during the period of 1985-2008. At the first stage, this study used the Cobb Douglas production function to explore the relationship between public capital accumulation and the productivity in the private sector in the US. At the second stage, this paper employed the ordinary least squares method; per capita product was used as explained variables and water, drainage, airports, roads, education and investment were explanatory variables. The regression analysis found that economic impact from infrastructure development was significantly spread through time in the long run. Furthermore, variation of infrastructure stock in different provinces made the different effects on economic growth in Mexican economy. A higher volume of infrastructure stock led to the higher volume of economic growth. This paper concluded that scarcity of infrastructure was the main huddles of economic growth in Mexican economy.

Tripathy, Srikanth, and Aravalath (2016) stated that infrastructure development is the back bone of economic development of the nation. The main objective of this study was to examine the relationship between gross investment on infrastructure development and economic growth in India. The Autoregressive Distributed Lag Model to cointegration was used to examine long- and short-run relationships between infrastructure investment and economic growth in India. Gross domestic capital formation (GDCF), revenue of the government (GRV), public & private employment (organized sector) level in the Indian economy, employment (EMP), inflation (INF), exports from India (EXP) were used as the proxy for gross investment in infrastructure sectors, and gross domestic product as the proxy for economic development. Time-series data (1971-2012) was used to explore the role of infrastructure investment on economic growth in India. Autoregressive distributed model found the short- and long-run positive—and statistically significant—relationship between gross investment on infrastructure development and economic growth in India, and inflation rate and economic growth were found to have a long-run inverse and statistically significant relationship.

Ashenafi (2017) analyzed the relationship between infrastructure development and economic growth for the period 1975-2015 of both short- and long-term effect of infrastructure development on economic growth, using ARDL, bounds tests, and ECM models. The long-run result showed that social- and economic-sector infrastructure development put positive effect on economic growth. The short-term estimation showed the speed of adjustment to be too slow. The study concluded that policy maker should give a lot of attention towards effective policy formulation and implementation of infrastructure development for the economic growth of the nation.

Chengete and Alagidede (2017) examined the growth effects of infrastructure stock and quality in Sub Saharan Africa (SSA). This study used infrastructure stock and quality data for 43 countries in SSA for the period 2000–2014. The infrastructures—such as electricity, telecommunication (fixed telephones plus mobile phones), roadways, water, and sanitation—were used as independent variables and GDP as a dependent variable. Principle components analysis, Generalized moments method, and Dumitrescu-Hurlin (D-H) non-causality test were used to investigate the role of infrastructure on GDP per capita growth in SSA counties.

This paper found a strong evidence of the positive and significant effect of infrastructure on economic growth in SSA countries. Furthermore, quality effects were found higher in the long-term than in the short-term. Eventually, this study concluded with a unidirectional causality from aggregate infrastructure to growth.

Wang, Ahmed1 Zhang, and Wang (2019) stated that Transport sector of Pakistan play a significant role on national energy consumption and economic development of the nation. The objective of this study was to investigate the relationship between urbanization, road infrastructure, and transport energy demand in Pakistan. The autoregressive distributed lag (ARDL) approach to cointegration was used to examine the long- and short-run relationships between dependent and independent variables during the period of 1971 to 2018. The vector error correction model was used to explore a causal relationship between dependent and independent variables. Road transport energy consumption (per capita kilometer transportation of oil equivalent), urban population growth rate, industrial value-added were used as the explanatory variables and GDP per capita as the dependent variable. This study found a positive, and significant, contribution of infrastructure development to the economic development of the nation—and a significant positive contribution of urbanization to road sector energy consumption.

Methodology

This study used the Engel Granger cointegration analysis and Error Correction model to investigate the relationship between infrastructure development and GDP growth in Nepal. Time-series data during the period of 1994 to 2018 were used to explore the contribution of infrastructure to GDP. Infrastructures refer to the total length of road (*TLR*) transportation, human capital (economically active population (*EP*), tertiary enrollment (*TE*)), and gross capital formation (*GCF*). All variables included in the model are converted into a real term. An Angel-Granger cointegration approach was used to explore the impact of infrastructure on *GDP* of Nepal. Thus, *GDP* is a positive function of infrastructure, which is presented in Equation 1.

$$GDP = f\,(TLR, EP, TE, GCF) \qquad (1)$$

For estimation purpose, a log linear model was used because the functional form affects the explanatory power of the variables. Box and Cox (1964) and Sargan (1964) argued that a log-linear model is preferred to a linear model because it is convenient to directly interpret the coefficients of dependent variables as elasticities with respect to independent variables. Furthermore, a log-linear model helps overcome the problem of heteroscedasticity and problem of multicollinearity (Gafar, 1988; Goldstein & Khan, 1976). Thus, this study selected a log-linear model to explore the relationship between infrastructure development and economic growth of Nepal. The long-run model of GDP that depends upon infrastructure development can be expressed in the following Equation 2.

$$\mathrm{Ln}GDP = \beta + \beta_1\mathrm{Ln}TLR + \beta_2\mathrm{Ln}EP + \beta_3\mathrm{Ln}TE + \beta_4\mathrm{Ln}GCF + \mu \qquad (2)$$

Where μ is white noise error term and this is normally distributed. Ln refers to the a natural logarithm of the respective variables. Because the data used in the study are time-series data, the study begins analysis by examining time-series properties of the data sets. In the case of stationary variables at the level form, an ordinary least squares method was used to estimate the relationship among the variables; in case of nonstationary time-series variables of the same order with their residuals being stationary, cointegration and error correction model were used to capture the long- and short-run relationship among the variables. After establishing the cointegration among the variables, error correction model (ECM) was estimated to examine the short-run dynamics of the relationship. In order to test the order of integration, this paper applied the Dick Fuller (DF), Augmented Dick Fuller test (ADF), and Phillip Perron (PP) test. The DF and PP test simply runs regression of the first difference of the series against first lagged value, constant and time trend as follows:

Without drift and deterministic trend $\Delta Y_t = \rho Y_{t-1} + \mu_t$ (3)

With drift $\Delta Y_t = \alpha + \rho Y_{t-1} + \mu_t$ (4)

With drift and deterministic trend $\Delta Y_t = \alpha + \beta t + \rho Y_{t-1} + \mu_t$ (5)

If μ_t are correlated in Equation 3 to 5, Dickey and Fuller have developed a test, known as Augmented Dickey Fuller (ADF) test, by adding the lagged values of the dependent variable (Y) to Equation 5 here. The ADF test estimates Equation 6:

$$Y_t = \alpha + \beta t + \rho Y_{t-1} + \sum_{i=1}^{k} \beta_i \Delta Y_{t-i} + e_t \quad (6)$$

Where, e_t is a pure white noise error term and $\Delta Y_{t-1} = (Y_{t-1} - Y_{t-2})$, $\Delta Y_{t-} = (Y_{t-1} - Y_{t-2})$, etc.; k is the lagged values of ΔY, and t is trend.

The hypothesis is

H_0: ρ =0. That is, there is unit root (nonstationarity) in time-series variables.

H_1: ρ ≠ 0. That is, the time-series variables are stationary (i.e., they contain no unit root).

Cointegration Analysis

This study employed the cointegration test. Consider Y_t as dependent and X_t as independent variables with order I (1). The linear combination of these variables without constant is $Y_t = \hat{\beta} X_t + \hat{\mu}_t$ or, $\hat{\mu}_t = Y_t - \hat{\beta} X_t$. The combination μ_t is also in order $I(1)$. In the situation variables are said to be cointegrated if the linear combination $I(1)$ is stationary; that is, two nonstationary time-series variables of the same order (e.g., GDP growth and infrastructures) are said to cointegrated if their residual (μ_t) is stationary. The DF and ADF tests subject these original time-series variables to unit-root test, but cointegration subjects their residual (μ_t) to unit-root test—for example, the DF or ADF unit-root test on the residuals to test cointegration;

the regression for two nonstationary time-series variables are never conducted except for the case of the cointegrating regression. Because cointegration test refers to the DF, or ADF, test on the residuals (μ_t and μ_{t-1}), Equation 7—based on Equation 3, for example—is known as an Angle-Granger (EG), or Augmented Engle-Granger (AEG), test for cointegration (Gujarati & Sangeetha, 2007):

$$\widehat{\Delta\mu} = \hat{\delta}\,\hat{\mu}_{t-1} \tag{7}$$

In fact, Engle and Granger (1987) developed a cointegration test to estimate the cointegrating regression through ordinary least square method, by obtaining residual series of $\hat{\mu}_t$, and to test the unit root of $\hat{\mu}_t$. To confirm the cointegration among the variables, this study run the Augmented Dickey Fuller stationary test of residual terms $\hat{\mu}_t$, and it compare with the Mackinnon (1991, as cited in Harris, 1995) critical values. The critical value can be estimated from this formula C(P) = $\phi = \frac{\phi_1}{n} - \frac{\phi_2}{n^2}$, where ϕ value is given by MacKinnon—based on the number of observation (n) and parameters used in the model. If the observed ADF *t*-statistic is greater than Mackinnon critical value, the null hypothesis (H_0) of the residual nonstationarity is rejected—meaning that the residuals are stationary; that is, the time-series variables included in the model are said to be cointegrated although these variables are nonstationary individually. The only cointegrating regression allows us to perform the Error Correction Mechanism (ECM) model to bring the variables, not in short-run equilibrium, back to long-run equilibrium. That is, the regression of one nonstationary variable upon another nonstationary variable—with their residuals being stationary—is used to find long-run coefficients, but the ECM model to find short-run coefficients. The Error Correction model can be written as equation 8.

$$\Delta GDP = \beta_0 + \beta_1 \sum_{i}^{k} \Delta GDP_{t-1} + \beta_2 \sum_{i}^{k} \Delta TLR_{t-1} + \beta_3 \sum_{i}^{k} \Delta EP_{t-1} + \beta_4 \sum_{i}^{k} \Delta GCF_{t-1} + \lambda EC_{t-1} + \varepsilon_t$$

Where,

Δ = first difference operator

EC_{t-1} = error correction term lagged one period

λ = short term coefficient of the error correction term ($-1 < \lambda < 0$)

ε_t = white noise term

Results and Discussion

In this analysis, gross domestic product was as a dependent variable, and infrastructures—such as, total length of road, percentage of economically active population, percentage of tertiary education enrollment, and gross capital formation—as independent variables. Besides, variables were logged by using Eviews version 9.5 computer programs to fix the data distribution problem for cointegration analysis.

Unit root test is used to check whether time-series data are stationary or nonstationary. The spurious regression results arise from these two cases: (1) two nonstationary time-series variables of the same order whose residuals are also nonstationary and (2) two nonstationary time-series variables of the different order (Enders, 2014). Table 1 presents the result of unit root test.

Table 1

ADF & PP Unit Root Test of Log Levels of Variables at level

Variables in level	Test Statistic			
	ADF		PP	
	Test statistic	Critical value at 5 percent	Test Statistic	Critical value at 5 percent
LnGDP	0.88	-2.99	0.88	-2.99
LnTLR	-1.02	-2.99	-1.86	-2.99
LnEP	-1.70	-2.99	-1.70	-2.99
LnTE	-0.34	-2.99	-0.50	-2.99
LnGCF	1.52	-2.99	3.11	-2.99

Source: Calculation from the Data Sets of N.R.B Quarterly Economic Bulletin and Economic Survey (2000, 2019)

Because the observed test-statistics (i.e., τ-statistic) were less than Mackinnon critical values in their absolute terms at the 5 percent level of significance in Table 1, the null hypothesis (nonstationarity) was retained, meaning that all time-series variables include in the model became nonstationary in in the level form. However, Table 2 shows whether the variables became stationary in first difference:

Table 2

ADF & PP Unit Root Test of Log Levels of Variables at First Difference

Variables in level	Test Statistic				Order of Integration
	ADF		PP		
	Test statistic	Critical value at 5 percent	Test Statistic	Critical value at 5 percent	
LnGDP	-3.69	-2.99	-3.70	-2.99	I(1)
LnTLR	-4.71	-2.99	-4.63	-2.99	I(1)
LnEP	-3.70	-2.99	-3.70	-2.99	I(1)
LnTE	-4.77	-2.99	-4.74	-2.99	I(1)
LnGCF	-4.77	-2.99	-4.49	-2.99	1(1)

Source: Calculation from the Data Sets of NRB Quarterly Economic Bulletin and Economic Survey (2000, 2019)

Because the observed test-statistics were greater than Mackinnon critical values in their absolute terms at the 5 percent level of significance in Table 2, the null hypothesis (nonstationarity) was rejected, meaning that all time-series variables (data) included in the model became stationary at the first difference, $I(1)$. Because the variables were nonstationary individually, $I(1)$, an Engel-Granger cointegration test was used to test whether there would be a long-run relationship between these nonstationary variables over the period of 1994 – 2018. The Engel-Granger cointegration equation is as follows:

Model 1

Estimated Long-run Coefficients (Dependent Variable is Ln*GDP*)

$$\text{Ln}GDP = -3.77 + 1.14^{***}\text{Ln}TLR + 0.32^{**}\text{Ln}EP + 0.18^{**}\text{Ln}TE + 0.35^{***}\text{Ln}GCF$$

T (-4.60) (11.44) (2.15) (2.67) (6.96)

R^2 = 0.99, *F*- statistic = 3067.32, *DW* = 2.72

Model 1 shows the long run coefficient of infrastructure variables showed appropriate sign and a statistically significant result at 5 percent level. Whether the estimated variables were cointegrated were confirmed by series of errors estimated from Model 1. Because the absolute value of the observed ADF *t*-statistics of residual series (7.70) were greater than that of the critical value of ADF statistics (4.99) at 5 percent significance level (for 25 observations with 5 parameters), the null hypotheses of no cointegration among the variables were rejected—implying that the ADF test-statistic of residuals confirmed a long-un association (cointegration) among the variables. Hence, the impact of infrastructure on GDP seemed positive and statistically significant. Model 1 is a cointegrating regression; thus, further this study was conducted for the ECM model as follows:

Model 2

Estimated Error Correction Model: Dependent Variable is D(Ln*GDP*)

$$D(\text{Ln}GDP) = 0.05 + 0.39D(\text{Ln}TLR)+0.17D(\text{Ln}EP)+ 0.08D(\text{Ln}TE) + 0.25D(\text{Ln}GCE) - 0.88Ect(-1)$$

P value 0.00 0.05 0.08 0.09 0.00 0.00

Adj. R^2 = 0.63, *F* = 8.93, *DW* = 1.64

The estimated coefficient of error correction term was statistically significant at 1 percent level. It stated that 88 percent disequilibria of the last year were corrected this year. The coefficient of total length of road was positive and statistically significant at 5 percent level—implying that the availability of road transport put the positive impact on total GDP in Nepal. The coefficient of economically active population was positive and statistically significant at 10 percent level; hence economically active population became a direct function of existing human capital in an economy. Similarly, the coefficient of tertiary education enrollment was positive and statistically significant at 10 percent level. Furthermore, the coefficient of GCF was positive and statistically significant at 1 percent level. The model was also examined for violation of OLS assumption. Breusch-Godfrey serial correlation LM test, and JB statistics showed that model free from autocorrelation and non-normally. Similarly, value of *F* statistics was significant at 1percent level. Thus, estimated results seemed logically reliable. It has been important to investigate whether the estimated relationship was stable or not during the study period. To test the stability of the model Recursive CUSUM test at 5 percent level of significance was used. After the plots of CUSUM statistics in the critical bounds at 5% level of significance, all coefficients in the given ECM were stable.

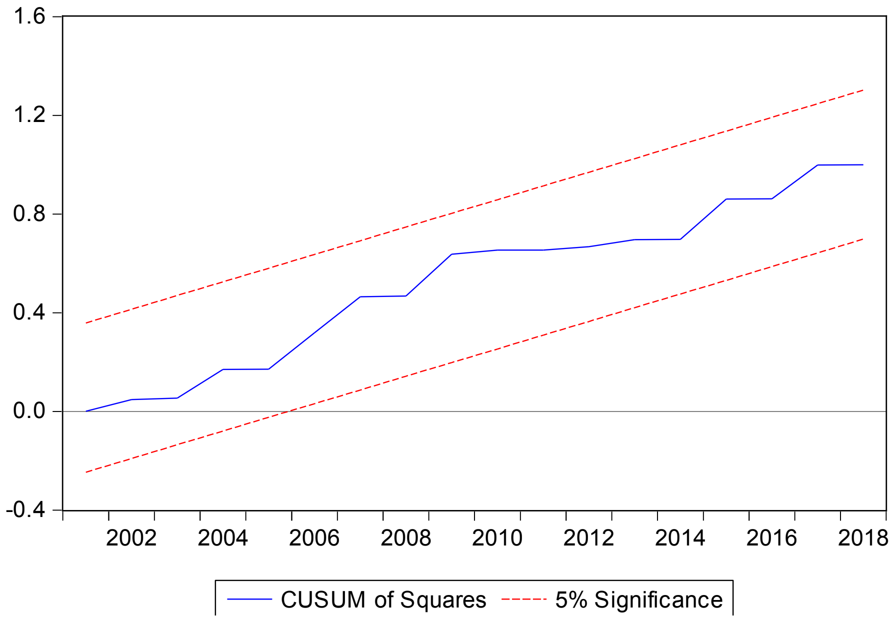

Figure 1. Plot of Recursive Residual (CUSUM).

In Figure 1, straight lines represent critical bounds at 5% significance level. It shows that the CUSUM plots lied within the bound (red lines). Thus, it provided the evidence that all the parameters included in the model were stable over the study period.

Conclusion

In the modern competitive business age, infrastructure development accelerates economic growth. In recent years, government of Nepal increases its investment on infrastructure development because of insufficient infrastructures. Thus, this study has attempted to analyze the impact of infrastructure development on economic growth in Nepal. The study has employed Engel Granger two-step cointegration and ECM model to examine the short- and long-run relationships between GDP and infrastructure development. The cointegration result showed short- and long-run relationships between infrastructure (total length of road, economically active population, tertiary education enrollment, gross capital formation) development and the volume of GDP. Analyzing the results, this paper found that total length of road, human capital and gross capital formation appeared to be the important factors to raise the volume of GDP. The sign of Error correction term (Ect) had negative and statistically significant at 1 percent level, indicating the possibility of convergence towards equilibrium in each period with adjustment captured by difference terms. According to estimated model, therefore, infrastructures were found to significantly affect the economic growth within the country. The finding of this study is consistent with those of the prior studies (Chengete & Alagidede, 2017; Gramlich, 1994; Srinivasu & Rao, 2013). This study has its implication for policymakers to enhance economic growth through infrastructure development. Moreover, the government should set its priority and target to raise the private and public investment towards infrastructure development. The expansion of infrastructure network enhances efficiency, competitive market, and economic growth within the country.

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