Research Article

Foreign Trade, Foreign Direct Investment and Economic Growth in Nepal

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ABSTRACT

One of the important issues that persist in the economic literature is the relationship between foreign trade, foreign direct investment and economic growth in host countries. This issue has become renewed interest in recent years mainly for countries suffering from unemployment problems and lack of technological progress. This paper analyzed this issue for Nepal using time series data over the period of 1995-2020.The ARDL bound test approach to co-integration has been used to analyze long-run and short-run relationship between variables. The study found that there is a co-integration between foreign trade, FDI and economic growth. The study also found that there is a strong positive interaction between foreign trade and FDI in progressing economic growth both in the short-run and long-run. The results show that the foreign trade and FDI can play a significant role to accelerate the economic growth of Nepal.

Keywords: Co-integration; economic growth; foreign direct investment; investment; foreign trade

INTRODUCTION

Foreign direct investment (FDI) and foreign trade have been widely recognized as the important catalysts of economic growth in developing countries. FDI is one of the most important factors of economic growth in the country which has insufficient domestic saving (Tanaya & Suyanto, 2021). FDI is considered as the main engine of economic growth especially in developing countries because of its benefits on technology transfer, capital

formation, the introduction of new production process, the creation of new jobs, managerial skills and employing training, international production networks, access to market (Bekhet & Al-smadi, 2015). Furthermore, the presence of foreign firms in host countries has created competition with domestic firms and local firm are forced to use the existing resources more efficiently and adopt new technology. FDI stimulates the economic growth by technology transfer, labor trainings, alternative management practices and organizational arrangements (De Mello, 1999). FDI causes spillovers through the transfer of knowledge to the host country which occurs when there is mobility of well-trained workers and managers from foreign firms to domestic firms (Borensztein et al., 1998). FDI promotes economic growth creating a more competitive business environment, which is essential toward alleviating poverty in developing and transition countries (Hobbs et al., 2021).

Increased foreign trade leads to sustainable economic growth in the long-run through the transmission of knowledge and technology from the import of superior-tech goods and enhancing internal domestic capacity (Okere et al., 2022). The studies on export-led growth hypothesis postulate trade as main engine of economic growth. Trade is considered as an important catalysis of economic growth because it encourages more efficient production of goods and services that have comparative advantage in producing them through the importation and adoption of superior production technology and innovation, increasing capital utilization and merits of economies of scale (Makki & Somwaru; 2004, Belloumi, 2014; Helpman and Krugman, 1985). Exporters are forced to adopt capital- intensive technology in production facilities to face hard competition in developing countries (Frankel and Romer, 1999). The export eliminates foreign exchange hurdles and thus providing greater access to international market (Esfahani 1991).Due to the accumulation of physical capital and technology transfer, the impact of trade on economic growth can be positive and significant (Belloumi, 2014).

In last four decades, Nepal has employed different incentives to attract FDI, trade liberalizations and market reforms in various sectors of the economy to reduce restrictions on FDI and develop the scope of FDI in different sectors of the economy. Nepal has introduced a comprehensive package of liberalized economic policies with the objective of rapid economic growth through the implementation of structural adjustment program in 1985 under the support of World Bank and IMF. Nepal has considered international trade and international investment as a tool for economic growth. The GoN has introduced new Foreign Investment and Technology Transfer Act (FITA), 2019 by replacing the Foreign Investment and Technology Transfer Act (FITA), 1992 in order to develop a favorable environment for foreign investment

by simplifying procedures and laws. Government of Nepal (GoN) has amended its past trade policy by the new trade policy 2015 to promote domestic industries, manage growing imports and boost exports, so that trade becomes an engine for economic development of the country. Furthermore, industrial policy, 1992 has been replaced by new industrial policy, 2011 to achieve high and sustained economic growth by encouraging both domestic and foreign investment.

Nepal has been performing poorly in terms of attracting and retaining FDI in spite of amending its past acts and policies. There is a fluctuation in the net inflows of FDI in Nepal. Furthermore, Theories and existing literature have given conflicting results about the relationship between FDI, economic growth and trade. The study carried out by Krstevska and Petrovska (2012) ; Lipsey(2004); Nourbakhshian et al., (2012) found a negative impact of FDI on economic growth. Likewise, Nepal has been performing weakly with respect to foreign trade, particularly in export side. Due to rising imports of goods and services over slower exports, Nepal's trade deficit has been expanding for in each fiscal year. Nepal is seeking FDI and international market for its goods and services to boost economic growth at present, hence, it is motivated identifying whether FDI and trade openness promote economic growth on prevailing economic setting. It is questionable whether the FDI and trade stimulate economic growth in Nepal. It is not possible to carry out effective policy without understanding the relationship among FDI, trade and economic growth. Thus, the study aims to analyze the relationship between economic growth, FDI and foreign trade.

The theory of absolute cost advantage states that the basis of international trade is an absolute cost advantage. Theory of Comparative cost advantage states that international trade between two counties occurs when one country can produce a good or service at a lower opportunity cost than another (Ricardo, 1817). According to the Heckscher - Ohlin theory, a country specializes in the production of goods that it is mainly suited to produce. Specialization in production and trade between countries produces a higher standard-of-living for the countries involved. According to this theory, the expansion of aggregate exports of the country has a positive impact on the economic growth through two ways. First, the aggregate exports add to the circular flow of income in the country through an improvement in the level of output by the multiplier effect. Second, the foreign exchanges received from exports of goods and services are used for the imports of essential inputs in the production system (Ozturk and Acaravc, 2010).

The early neo-classical approach is based on the assumptions of perfect competition and

capital movements free of risks and believes that capital transfers from one country to another country due to interest rate differential (Harrison et al., 2000). According to this approach, capital moves from countries where return on capital is low to countries where return on capital is high. On the other hand, the portfolio investment approaches to FDI believes that capital transfers from one country to another country not only from return differentials but also from risk reacting the early neo-classical approach to FDI. The product life cycle theory of FDI was first propounded by Vernon in 1966 which states that when the home market becomes saturated, a country will export its product to other countries and the firm starts to open businesses in locations where cost of production is lower. Therefore, FDI is the stage in the product lifecycle that follows the maturity stage. Dunning (1977) developed an eclectic theory of FDI that incorporates three theories referred to as OLI: O represents ownership, L localization and I Internationalization Theories. Ownership advantage is a firm specific advantage that gives power to firms over their competitors. This includes advantage in technology, in management techniques, easy access to finance, economies of scale and capacity to coordinate activities (Dunning, 1977). Location advantages are country specific advantages. Transnational Companies (TNCs) in order to fully reap the benefit of firm specific advantages, they should consider the location advantage of the host country. This includes accessibility and low cost of natural resource, adequate infrastructure, political and macroeconomic stability.

Harrod (1938) & Domar (1946) assigned a vital role to capital accumulation in the process of growth. This model emphasized the dual role of capital accumulation. The new investment not only generates income through multiplier effect but also it increases productive capacity through productivity effect of the economy by expanding its capital stock. According to this model, investment is the driving force of growth. Growth can be achieved only at a higher rate of investment if the labor force and technology are exogenously determined. This model attempts to explain long-run economic growth by looking at capital accumulation, labor or population growth, and increases in productivity, commonly referred to as technological progress. For Solow-Swan growth model, a short-run production function is used where labor and capital are production inputs. If one input of production is assumed to be fixed an increase in another input of production leads to a decline in output productivity. For example, an increase in capital in the production process leads to diminishing returns of output assuming labor as a fixed input of production (Solow, 1956).

Technological advancement plays a crucial role in the economy according to the Neo-classical growth model. Technological advancement that increases productivity of capital

and labor postpones the diminishing returns and it accelerates the speed of economic growth. Technical advancement is enough for the growth process and does not require high capital accumulation unlike the Harod – Domar model. With a given capital, higher technology gives higher output (Solow, 1956). In the Romer-Lucas model of growth, unlike the Solow-Swan growth model, technological change is not exogenously determined but it is derived from the capital accumulation process. Accumulations of capital goods that are used to produce consumer goods enable workers to learn how to operate high technology machinery and modify them (Lucas, 1988). Such a learning process allows technological advancement. According to this theory there will be no diminishing returns of output because of the associated technical advancement of the capital accumulation as there occurs capital deepening. Thus capital accumulation is still the important factor in achieving economic growth (Romer, 1994).

Adhikary (2015) investigated the linkage between FDI, trade openness, capital formation, human capital, and economic growth rate in Nepal using the vector error correction (VEC) model. The study found that there exist a long-run equilibrium relationship between variables and trade openness and FDI have a dynamic positive effect on the GDP per capita growth rate in Nepal. On the contrary, human capital did not appear to be a significant factor, while capital formation exhibits a negative association with rates of economic growth. The VEC based Granger causality test indicated that a unidirectional short-term causal flow runs between FDI, trade openness, and GDP per capita growth rate. However, the impulse response analysis showed that this relationship was not stable rather volatile over time. Phuyal & Sunuwar (2018) examined the sector wise effects of FDI on economic growth in Nepal represented by gross domestic product (GDP) and FDI as dependent and independent variables respectively, thereby identifying the direct effect of FDI on GDP using 10 years (2007 to 2016) sectoral data as main source of the information. The finding of the study was that FDI of industry, tourism and agriculture sectors had a very positive and significant impact on GDP during the stipulated timeframe. Kalai & Zghidi (2018) analyzed the relationship between foreign direct investment, trade, and economic Growth in MENA Countries using ARDL Bounds Testing Approach**.** The main objective of the study was to analyze the interrelationship between foreign direct investment (FDI), international trade, and economic growth for 15 selected Middle Eastern and North African countries over the period 1999–2012. The study found that there exist long-run unidirectional relationships running from FDI to economic growth in MENA countries. Ali & Xialing (2017) analyzed the relationship between foreign direct investment, international trade and economic growth in Pakistan by using the time series data over the period of 1991 to

2015. The objective of the study was to analyze the relationship of international trade, foreign direct investment and economic growth in Pakistan's economic perspective. The finding of the study was there is a positive relationship among international trade, foreign direct investment and economic growth in Pakistan's economic perspective. The conclusion of the study was that FDI stimulates economic growth by capital formation, transfer of technology, adding labor skills, increasing competition in the domestic market and creating new job opportunities. Okere et al., (2022) analyzed the relationship between FDI, trade openness and economic growth in Nigeria and the results provide evidence that global economic crisis significantly dampens economic growth, the negative interaction of total trade, FDI and global financial economic crisis is substantive enough to dampen the trade-growth and FDI-growth led relationship and the negative interaction of FDI-inflow with global economic crisis is more pronounced and substantive in the long run than the short run. Belloumi (2014) investigated the relationship between trade, FDI and economic growth in Tunisia by using autoregressive distributed lag model. The result of the study showed that there is co-integration among the variables specified in the model when FDI is taken as dependent variable. It means in the long run trade openness and economic growth promotes foreign direct investment in Tunisia. Bekhet & Al-smadi (2015) evaluated the study on the determinants of Jordanian foreign direct investment in flows using bounds testing approach. The study found that there are long-run and short-run relationships among FDI and its determinants. Moreover, the Granger causality test recommends a deferent causal relationship among FDI and their determinants.

DATA AND METHODS

Annual time series data on GDP, FDI, foreign trade and labor force covering the 1995-2016 periods were used in this study to address the objectives of the study. GDP is the real GDP expressed at 2000/01 prices and the data for GDP have been taken from Current Macroeconomic and Financial Situation published by Nepal Rastra Bank, FDI is an actual FDI which is the difference of FDI inflows and withdrawal of investment and the data for it have been taken from a survey report on Foreign Direct Investment published by Nepal Rastra Bank, LABOR is labor force having age 15-64 and due to unavailability of data in Nepal for the entire sample period, labor force has been taken from World Development Indicators (2018) published by World Bank and TRADE indicates the foreign trade which is the sum of exports and imports. FDI and TRADE are converted in to real terms using 2000/01 prices. ε_t is a white noise error term. The expected sign of β_1 β_3 and β_3 are expected to be positive.

The results of the reviewed literature show varied results with regards to the impact of FDI on economic growth. However, in Nepal, the government have given due attention to attract foreign investors into this potential sub-sector. Consequently, the expected sign of FDI in this study was expected to be positive. Nepal has adopted more liberalized and opened trade policy to take the benefit from international trade. Therefore, the expected sign of trade TRADE in this study is expected to be positive. The expected sign of LABOR in this study is supposed to be positive.

The data for chosen variables have been taken from the different sources because these variables are collected and published from different sources. Data used in the study are assumed to be valid and reliable because all data are published by the responsible bodies of the government of Nepal and World Bank. Furthermore, these published data have been used by researchers and academicians for their study. The data on the chosen variables are easily found in the websites of above mentioned sources and anyone can use them for the study.

The assumption of the test is that there is long-run and short-run relationship between FDI, trade and economic growth. Dickey- fuller (ADF) test is employed to test the sationarity of variables under study. This study has employed the ARDL technique proposed by Pesaran at al. (2001).The first step of autoregressive distributed lag (ARDL) bound test is to examine the stationarity of variables to see the order of co-integration. The Eviews 9 software has been used to run ARDL approach to co-integration.

Autoregressive Distributed Lag (ARDL) to Cointegration Analysis

This study has employed the ARDL technique proposed by Pesaran at al. (2001).The first step of autoregressive distributed lag (ARDL) bound test is to examine the stationarity of variables to see the order of co-integration. The main assumption of ARDL bounds test is that the variables should be I(0) or I(1). If there is I(2), the ARDL bound test is not suitable because the result so obtained can be spurious (Pesaran and shine, 1999).Therefore, before applying this test, Augmented Dickey Fuller test (ADF) by Dickey and Fuller (1979) has been used to determine the order of integration of all variables.

After testing the stationarity of variables, the ARDL bounds test of cointegration developed by Pesaran and Shine (1999) and Pesaran et al., (2000) was employed to examine the cointegration for long-run relationships among the variables of interest. Following the ARDL approach proposed by Pesaran and Shin (1999), the ARDL model used in this study is the following:

Model 1

$$\Delta GDP_t = \alpha_0 + \beta_1 GDP_{t-1} + \beta_2 FDI_{t-1} + \beta_3 LABOR_{t-1} + \beta_4 TRADE_{t-1} + \sum_{i=1}^{p} \Upsilon 1i GDP\ t - i + \sum_{i=0}^{p1} \Upsilon 2i FDI\ t + \sum_{i=0}^{p3} \Upsilon 3i\ LABOR\ t - i \sum_{i=0}^{p2} \Upsilon 4i\ TRADE\ t - i + \varepsilon_t$$

Model 2

$$\Delta lnGDP_t = \alpha_0 + \beta_1 lnGDP_{t-1} + \beta_2 lnCAPITAL_{t-1} + \beta_3 lnLABOR_{t-1} + \beta_4 lnTRADE_{t-1} + \sum_{i=1}^{p} \Upsilon 1i InGDP\ t - i + \sum_{i=0}^{p1} \Upsilon 2i\ InCapital\ t - \sum_{i=0}^{p3} \Upsilon 3i\ InLABOR\ t - i \sum_{i=0}^{p2} \Upsilon 4i\ InTrace\ t - i + \varepsilon_t$$

Where, ε_{1t} = white noise error term

H_0: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$ (there is no cointegration)

H_1: $\beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq 0$ (there is conintegration)

The F-test was employed to test co-integration among the variables. If the computed F-value was less than the F-value for the lower bound, then the null hypothesis cannot be rejected. If the computed F-value exceeded the F-value for the upper bound, then the null hypothesis of no co-integration was rejected, otherwise the test was inconclusive. (Pesaran et al. 2001). To select the lag values p, q_1, q_2, q_3, q_4, and q_5 in Equation (3), model selection criteria, such as AIC, SIC, Hannan-Quinn information criteria, Adjusted R-squared were used.

Error Correction Model

There must have an error correction representation wherein an error correction term (ECT) is incorporated in the model, if a set of variables is co-integrated (Engle and Granger 1987). The short-run dynamics of the variables was described by employing the Error Correction Model (ECM). The ECM representation was specified as follows:

Model 1

$$\Delta GDP_t = \gamma_0 + \sum_{i=1}^{p} \Upsilon 1i GDP\ t - i + \sum_{i=0}^{p1} \Upsilon 2i FDI\ t + \sum_{i=0}^{p3} \Upsilon 4i\ LABOR\ t - i \sum_{i=0}^{p2} \Upsilon 3i\ TRADE\ t - i + \gamma_5\ ECT_{t-1} + \nu_t$$

Model 2

$$\Delta lnGDP_t = \gamma_0 + \sum_{i=1}^{p} \Upsilon 1i InGDP\ t - i + \sum_{i=0}^{p1} \Upsilon 2i\ InCapital\ t - \sum_{i=0}^{p3} \Upsilon 3i\ InLABOR\ t - i \sum_{i=0}^{p2} \Upsilon 4i\ InTrace\ t - i + \gamma_5\ ECT_{t-1} + \nu_t$$

Where λ_{1i} , λ_{2i} ,λ_{3i} and λ_{4i} are the short-run dynamic coefficients of the model's convergence to the equilibrium and γ_5 is the speed of adjustment parameter, indicating how quickly the series can come back to its long-run equilibrium. The sign of the coefficient must be negative and significant.

RESULTS AND DISCUSSION

Descriptive Statistics

The results of the descriptive statistics and pair- wise correlations among the variables under consideration have been shown in the Table 1. Table 1 presents that the mean values of real GDP, real FDI, LABOR and trade are 552610.6 million, 1254.593 million, 14549803 and 205338.9 million respectively in the level form. The values of standard deviation show that the chosen variables experienced substantial variation during the study period.

Table 1

Descriptive Statistics and Correlation Matrix

Variables	GDP	FDI	LBR	TRADE
Mean	552610.4	1254.59	14549803	205338.9
Median	523262	877.74	14685929	184899.7
Maximum	832060	4201.22	16922877	330759.8
Minimum	347921	-369.69	11825747	131858.7
Std. Dev.	145925.9	1395.69	1565110	59128.67
Skewness	0.36	0.93	-0.23	0.79
Kurtosis	1.93	2.72	1.77	2.43
J-B	1.52	3.23	1.59	2.60
P-value	0.47	0.20	0.45	0.27
Pair-Wise Correlation				
GDP				
FDI	0.64			
LBR	0.97	0.57		
TRADE	0.97	0.64	0.89	

Source: Author's Calculation.

The results indicate that the variables employed in his study are normally distributed based on the Jarque- Bera test and skewness. This is because the P- values of each variable are greater than 5% and the values of skewness are less than one. The result of pair-wise correlation shows that all the variables are in acceptance range of correlation coefficients. The table indicates that GDP is positively and strongly correlated with FDI, LABOR and TRADE. FDI has a positive correlation among the variables LABOR and TRADE. The highest correlation occurs between the variables GDP, FDI and TRADE. It is also noted that LABOR is positively correlated with TRADE.

Stationary Test (Unit Root Test)

A pre-requisite for co-integration is to test the order of integration for each time series which is called unit root test (stationarity test). The stationarity test is conducted to ensure that no time series is integrated of order 2, i.e. I(2) to justify the appropriateness of the ARDL bounds test approach to co-integration. There are different techniques that have been employed to test the stationarity of individual variables. Among them some of the notable techniques are Augmented Dickey- fuller (ADF) test, Phillips-Perron test, KPSS test and so on. In this study, Augmented Dickey- fuller (ADF) test is employed to test the sationarity of variables under study. The results of ADF test are shown in Table 2.

Table 2

Results of Unit Root Test Using ADF (Augmented dickey- fuller) Test for Model 1

Variables	Status	ADF test statistics		Order of integration
		Intercept	Intercept and Trend	
GDP	Level	3.92	0.29	
FDI	Level	-1.17	-1.72	
LABOR	Level	-1.10	-6.10*	I(0)
TRADE	Level	4.27	1.22	
GDP	First difference	0.02	-3.831*	I(1)
FDI	First difference	-3.73**	-2.64	I(1)
LABOR	First difference			
TRADE	First difference	-4.81*	-4.40**	I(1)

Note: (*), (**) & (***) show 1%, 5% and 10% level of significance respectively.

Source: Author's Calculation.

Table 2 shows that LABOR is stationary at its level data I(0) However, GDP, FDI, GFCF and TRADE are not stationary at their level values I(0)but are stationary at their first difference I(1). This implies that some series are stationary at I(0) and some are at I(1). Due to the presence of mixed orders of integration (I(0), I(1)), an appropriate method of analyzing the long run relationship between variables is Autoregressive Distributed Lagged (ARDL) bounds test (Pesaran et al., 2000). Therefore, this study used ARDL bound test approach to examine the cointegrating relationship among variables under study.

Table 3

Results of Unit Root Test Using ADF (Augmented dickey- fuller) test for Model 2

Variables	Status	ADF test statistics		Order of integration
		Intercept	Intercept and Trend	
lnGDP	Level	0.26	-3.20	

lnCAPITAL	Level	3.16	-0.98	
ln LABOR	Level	-2.01	-4.45**	I(0)
lnTRADE	Level	3.53	-0.74	
lnGDP	First difference	-5.15*	-5.55*	I(1)
lnFDI	First difference	-1.84	-2.86***	I(1)
lnLABOR	First difference			
lnTRADE	First difference	-6.25*	-5.25*	I(1)

Note: (*), (**) & (***) show 1%, 5% and 10% level of significance respectively.

Source: Author's Calculation.

Table 3 shows that LABOR is stationary at its level data I(0) However, GDP, FDI, GFCF and TRADE are not stationary at their level values I(0)but are stationary at their first difference I(1). This implies that some series are stationary at I(0) and some are at I(1). Due to the presence of mixed orders of integration (I(0), I(1)), an appropriate method of analyzing the long run relationship between variables is Autoregressive Distributed Lagged (ARDL) bounds test (Pesaran et al., 2000). Therefore, this study used ARDL bound test approach to examine the cointegrating relationship among variables under study.

Lag Length Selection Criteria

The VAR lag length selection criteria was employed to select appropriate lag length of the ARDL bound test. The results have been shown in Table 4.

Table 4

Lag Length Selection Criteria of VAR

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-966.34	NA	1.60E+35	92.41	92.61	92.45
1	-853.21	172.39*	1.60e+31*	83.16*	84.15*	83.37*

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

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Source: Author's Calculation.

There were different criterions to select appropriate lag length such as LogL, sequential modified LR test statistic (LR), Final prediction error (FPE), Akaike information criterion

(AIC), Schwarz information criterion (SC) and Hannan-Quinn information criterion HQ. However, this study employed Akaike info Critorian (AIC) to select lag length. Accordingly, a lag length of 1 was employed in the model.

Bound Test of Co-integration Test

The Eviews 9 software has been used to run ARDL approach to co-integration. The calculated F- statistics, the lower bound critical value I(0) and upper bound critical value I(1) are presented in the Table 5. Finally, all calculated F-statistics are compared with the Pesaran et al. (2001) critical value.

Table 5

Results of the Bound Test for Co-integration

Dependent Variable	AIC lag Length	F-Statistic	Decisions
FGDP(GDP/FDI, LABOR,TRADE)	(1, 1, 1, 0)	5.78*	Co-integration
FGDP(GDP/CAPITAL,LABOR,TRADE)	(1, 0, 2, 1)	5.52*	Co-integration
Critical value I0 bound I1 bound			
1% significance level	2.72	3.77	
5% significance level	3.23	4.35	
10% significance level	4.29	5.61	

Note: * shows level of significance at 1%.

Source: Author's Calculation.

The Table 5 shows that the calculated F-statistic is 5.78 for model 1 i.e. F_{GDP} (GDP/FDI, LABOR, TRADE) = 5.78 which is greater than upper bound critical value 4.45 at 5 percent level of significance. This implies that the null hypothesis of no co-integration among the variables is rejected. Similarly, the calculated F-statistic is 5.52 for model 2 i.e. F_{GDP} (GDP/ CAPITAL, LABOR, TRADE) = 5.52 which is greater than upper bound critical value 4.45 at 5 percent level of significance. Therefore, in both models, variables are co-integrated of each other.

The Long-run relationship of the models and the results of diagnostic tests

Table 6 shows the estimated long-run coefficients for the models 1 &2. According to model 1, FDI has a positive and significant relationship with GDP at 1 percent level. The long-run coefficient value of 9.84 for the FDI showed that one million increases in real FDI increases the real GDP by 9.84 million in the long-run. In the same way, the positive and significant value of TRADE coefficient showed that one million increases in real TRADE increased real GDP by 0.05 million in the long-run. Similarly, the positive and significant value of long-run

coefficient of 1.26 for the LABOR implied that GDP is increased by 1.26 million if LABOR increased by one unit. FDI, LABOR AND TRADE are statistically significant at 1 percent level and the signs of coefficients of all these variables are as the study expected.

Table 6

Long-run Relationship of the Models and the Results of Diagnostic Tests

Variables	Model 1 FGDP(GDP/FDI, LABOR,TRADE)	Variables	Model 2 FGDP(GDP/CAPITAL, LABOR, TRADE
	Coefficients		Coefficients
FDI	9.84*	LnCAPITAL	0.16*
TRADE	0.05*	LnTRADE	0.22*
LABOR	1.26*	LnLABOR	0.76*
Constant	-462617.4*	Constant	-1.8*
R2	0.63	R2	0.88
Adjusted R2	0.47	Adjusted R2	0.81
F-Statistic	4.04**	F-statistic	13.23*
D-W	2.7	D-W	1.99
Serial correlations	2.90[0.11]	Serial correlations	0.74[0.49]
Heterocedasticity	0.53[0.77]	Heterocedasticity	1.70[0.19]
Normality	1.33[0.51]	Normality	1.15[0.56]

Note: *, **, and *** represent 1%, 5%, and 10% level of significance respectively.

[ ] indicates Probability values.

Source: Author's Calculation.

According to model 2, CAPITAL has a positive and significant relationship with GDP at 1 percent level. The long-run coefficient value of 0.16 for the CAPITAL showed that one percent increases in real CAPITAL increases the real GDP by 0.16 in the long-run. In the same way, the positive and significant value of TRADE coefficient showed that one percent increases in real TRADE increased real GDP by 0.22 percent in the long-run. Similarly, the positive and significant value of long-run coefficient of 0.76 for the LABOR implied that GDP is increased by 0.76 percent if LABOR increased by one percent. CAPITAL, LABOR AND TRADE are statistically significant at 1 percent level and the signs of coefficients of all these variables are as the study expected.

The study also carried out all diagnostic tests such as Breusch-Godfrey serial correlation test for serial correlation, Breusch-Pagan –Godfrey test for heteroskedasticity test and Jarque-Berra test for normality. The result of Breusch-Godfrey serial correlation test showed that there is no serial correlation because p value is greater than 5% and this accepts the null hypothesis of

no serial correlation. The result of Breusch-Pagan –Godfrey test of heteroskedasticity showed that there is no heteroskedasticity because p value is greater than 5 percent and this accepts the null hypothesis of no heteroskedasticity. The result of Jarque –Bera test of normality showed that there is normality in residuals because p value Jarque –Bera test is greater than 5 percent which accepted the null hypothesis of there is normality in residuals. The results of diagnostic tests indicated that the model was correctly specified. The results of diagnostic tests show that there is no serial correlation, no heterscedasticity and there is normality in residuals. The results of R squares and F-statistics showed that the model is well fitted.

Short-run Relationship of the Models

Table 4.9 shows the short-run relationship among the variables for models 1 and 2. The result illustrated that FDI, LABOR and TRADE have a positive and significant relationship with GDP at 5%, 1% and 1%level respectively.

Table 7

Short-run Relationship of the Models

Variables	Model 1 FGDP(GDP/FDI, LABOR,TRADE)	Variables	Model 2 FGDP(GDP/ CAPITAL,LABOR,TRADE
	Coefficients		Coefficients
D(FDI)	2.40**	D(lnCAPITAL)	0.16*
D(TRADE)	0.077*	D(lnTRADE)	0.20*
D(LABOR	0.62*	D(lnLABOR)	-1.05
		D(LABOR(-))	1.58
ECM(-1)	-0.49*	ECM(-1)	-0.31*

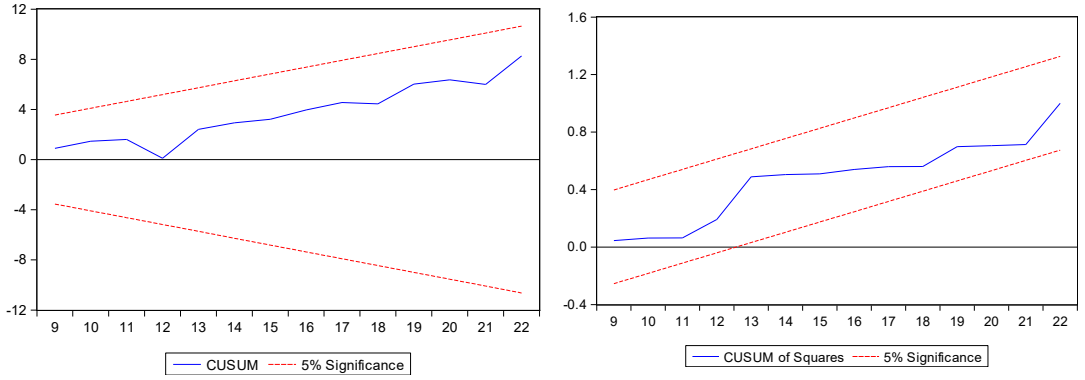
Note: (*), (**) & (***) show 1%, 5% and 10% level of significance respectively.

Source: Author's Calculation.

If a set of variables is co-integrated, there must have an error correction representation wherein an error correction term (ECT) is incorporated in the model (Engle and Granger 1987). According to error correction model, the sign of the coefficient of ECM must be negative and statistically significant. The negative and statistically significant estimation of ECM_{t-1} in two models shows a short-run relationship among the variables of the model under study. The coefficient of ECM_{t-1} for model 1 is -0.49 which implies that in the short-run the deviations from the long-run equilibrium are corrected at 49 percent each year. The coefficient of ECM_{t-1} for model 1 is -0.31 which implies that in the short-run the deviations from the long-run equilibrium are corrected at 31 percent each year.

Stability Test

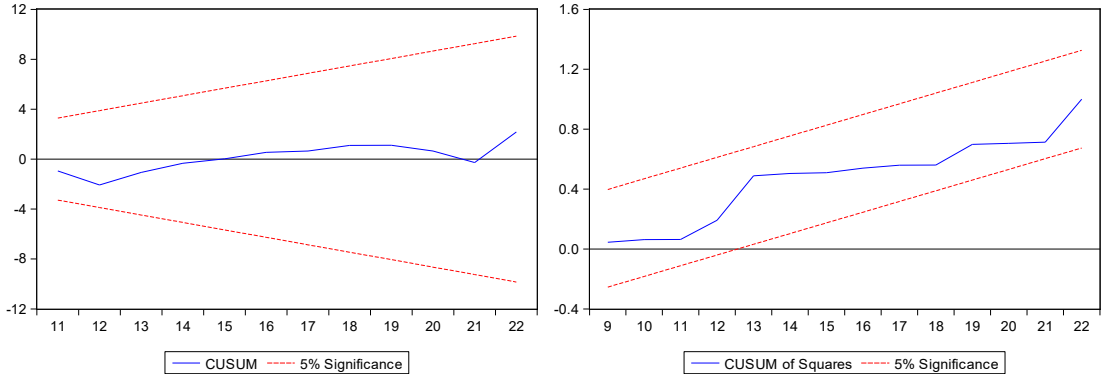
The stability test of the model as well as individual parameters were carried out by plotting cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of residuals (CUSUMQ). The results of CUSM and CUSUMQ for model 1 and 2 are shown in Figures 1. In both models, the residuals are within the critical bounds at the 5% significance level which indicated that the model was correctly specified and stable.



Note: The straight line represents critical bounds at 5% level of significance.

Source: Author's Calculation.

Figure 1: Plot of CUSUM and CUSUMQ for Model 1



Note: The straight line represents critical bounds at 5% level of significance.

Source: Author's Calculation.

Figure 2: *Plot of CUSUM and CUSUMQ for Model 2*

In both models, the residuals are within the critical bounds at the percent significance level which indicated that the model was correctly specified and stable.

CONCLUSIONS

This study is related to the study of the relationship between economic growth, FDI and TRADE of Nepal using time series data from FY 1995/96 to FY 2016/17. Based on the finding of this study, it can be concluded that increase in FDI has a positive impact to economic growth of Nepal. This is because FDI supplies long-term capital with new technologies, managerial know-how and marketing capabilities that lead to increased economic growth by creating employment opportunities, managerial skills, diffusing technologies and fostering innovations. The impact of FDI on an economy can be considered in terms of a number of indicators such as its potential contribution to: technology and skills; establishment of new industries and export promotion; formation of new clusters as anchor investors; and creation of linkages with, and associated upgrading of local enterprises.

This study also found that there is a positive and significant impact of foreign trade on GDP of Nepal in the long-run. The accumulation of physical capital and technology transfer through foreign trade stimulates economic growth of Nepal. Foreign trade encourages economic growth through the importation and adoption of superior production technology and innovation, increasing capital utilization and merits of economies of scale. The export eliminates foreign exchange hurdles and thus providing greater access to international market.

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