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IMPACT OF FOREIGN DIRECT INVESTMENT AND INFLATION ON GDP IN NEPAL

ANISHA BHATTARAI

ABSTRACT

This paper examines the impact of Foreign Direct Investment and Inflation on GDP in Nepal. The data were taken from the period of 2000 to 2020 for the study. The main purpose of the study is to use the ARDL and ECM models to analyze how Foreign Direct Investment and Inflation has affected Nepal's Gross Domestic Product. Descriptive and analytical research methods were used with secondary data. Gross Domestic Product (GDP) is taken as dependent variable and FDI and Inflation are taken as independent variables. The results of the study revealed that FDI has positive and statistically significant relationship with Gross Domestic Product in the long run. Similarly, inflation has a negative and statistically insignificant relationship with Gross Domestic Product in the long run. The findings of this study revealed that increase in Foreign Direct Investment increases the Gross Domestic Product of Nepal.

Keyword: ARDL, ECM, Foreign Direct Investment, Inflation, Gross Domestic Product and Economic Growth.

I. INTRODUCTION

Foreign direct investment is an investment made into commercial interests located in another country by a company or an individual. FDI often occurs when a foreign business operation is established or when an investor buys foreign business assets for a foreign company. For the economic growth and development of the least developed countries (LDCs), FDI can be a significant source of financing to support local investment (NRB survey report, 2018/19). Any country's ability to experience rapid economic growth is significantly influenced by FDI. In order to operate activities through international channels, a long-term and effective investment must be acquired. FDI is generally understood to refer to a foreign country's inflow of both cash and non-monetary goods. It is a type of cross-border investment where a resident of one country exercises significant control over or influence over a company's management and operations in a different country (IMF, 2010). FDI is one of the best ways for developing nations to keep friendly

connections with the rest of the globe (Hossain, 2012). According to the balance of payments, it is the total of equity capital, reinvestment of earnings, other long-term capital, and short-term capital (NRB, 2017). Nepal is an uncharted territory for FDI affiliates. Both labor and natural resources are easily accessible. Nepal should manage and regulate the business environment in order to draw FDI. Political stability, a business-friendly regulatory environment, a country's infrastructure, the value of its land, and its tax system are some of the variables that influence multinational corporations' decisions. In summary, FDI promotes both the host country's economy and the economy of the home country by expanding, diversifying, and increasing market share, as well as through influencing the domestic economy to the global economy. According to Pyakurel (2074) prospects for luring FDI on a country's prosperity come from its own special advantages. The distinctive quality of FDI is that it transfers to a host country a package of resources, including capital, technology, skills, management expertise, and marketing capabilities, along with production activities. Affiliates of the host nation maximize profit by effectively utilizing these resources and competencies. When the majority of products and services' prices keep rising, there is inflation. The consumer price index is a tool for measuring inflation (CPI).

Inflation is defined as an increase in the general price of goods and services over a given time period. When the price of one product rises, each unit of currency purchases fewer goods and services. According to Ireland (2022), inflation is caused by excessive money supply. Inflation has been the government's primary preoccupation because it has substantial implications for the lives of ordinary people. Furthermore, it influences various macroeconomic variables such as saving, investment, real interest, real wage, real income, and employment level. Inflation causes the home currency to depreciate, making imports more expensive, further raising domestic costs. In brief, inflation is a major concern in macroeconomics, and the primary goal and duty of central banks is to manage inflation.

One of the world's most pressing issues is determining the relationship between FDI and Inflation on GDP in Nepal. Only a few descriptive analysis-based studies have been conducted. However, no notable efforts have been made thus far in the specific topic of the link between FDI, Inflation and GDP. As a result, the research justifies the current work.

II. REVIEW OF LITERATURE

Several studies on inflation, foreign direct investment, and the gross domestic product have been provided. The majority of the research has been conducted on a global scale. Some of the most important empirical researches have been evaluated in order to set goals in the context of Nepal and then analyze them in order to derive some crucial conclusions and policy recommendations.

2.1. Empirical evidence about the impact of FDI on GDP

According to Pokharel and Pokharel (2019), FDI indicates a favorable trend of investment, which ultimately leads to an increase in GDP and economic growth in the country. The study's findings demonstrated that an increase in FDI enhances the country's GDP. Wai Mun et al. (2010) used ordinary least square regression and the empirical analysis were conducted by using annual data on FDI and economic growth in Malaysia. The results shows that there is significant relationship between economic growth and foreign direct investment inflows in Malaysia. Adam and Tweneboah (2016) conducted a study on FDI and stock market development in Ghana, concluding that FDI had a positive impact on the development of the economy and the stock market. Hoang et al. (2010) analyzed the effects of FDI on economic growth in Vietnam by using panel data from sixty-one provinces over the period 1995–2006. This study finds that there is a strong and positive impact of FDI on GDP in Vietnam, where the additional capital from FDI helps promote economic growth in Vietnam.

Bista (2005) examined the relationship between FDI and GDP along with the impact of FDI determinants on FDI inflows in Nepal. The outcome of employing the Cobb Duglas Production model and a theoretical growth model demonstrates a favorable association between GDP and FDI. Falki (2009), published a comprehensive study on the impact of FDI on Pakistan's economic development. The analysis used data on FDI from the 2005 Handbook of Pakistan Economy. Data was collected between 1980 and 2006 and included characteristics such as domestic variables, labor force, and foreign invested capital.

2.2. Empirical evidence about the impact of Inflation on GDP

According to Barro (1995), there is a negative link between inflation and economic growth. The study includes a large sample data set of more than 100 economies from 1960 to 1990, and to investigate the effects of inflation on growth, a system of regression equations is utilized, with other factors held constant. Kasidi & Mwakanemela (1975), studied the impact of inflation on Tanzania economic development from 1990 to 2011. They used the Johansen Cointegration Test to discover that, while there is no cointegration or long-run relationship between inflation and economic growth, inflation has a negative impact on economic growth.

Majumder (2016) used the Granger Causality and Error Correction Model to determine that there is a statistically significant and long-run positive relationship between economic growth and inflation in Bangladesh from 1975 to 2013. Adhikari (2014) used Distributed Lag Models on annual GDP and Consumer Price Index (CPI) data from 1975 to 2012 to show that current economic output in Nepal is negatively affected by current period inflation but positively affected by previous period inflation.

According to Paudyal, (2014), variables such as budget deficits, Indian pricing, wide money supply, exchange rate, and real GDP all influence inflation in Nepal.

III. METHODOLOGY

3.1. Data Source

The study's goal is to examine the influence of FDI and inflation on Nepal's GDP. The research spans the years 2000 to 2020. Because the World Bank is regarded as a reputable source of data collection, data of the Foreign Direct Investment (FDI), Inflation and Gross Domestic Product (GDP) were retrieved from the World bank. The following theoretical model is used to assess the influence of FDI and inflation on Gross Domestic Product in Nepal. For this article, Gross Domestic Product is used as the independent variable and Foreign Direct Investment and Inflation as dependent variable. So, the general model that shows the relationship between the FDI, Inflation and RGDP can be written as:

$$RGDP = \beta_0 + \beta_1 FDI + \beta_2 INF + \varepsilon$$

where,

RGDP= Real Gross Domestic Product

FDI= Foreign Direct Investment

INF= Inflation

ε = Error term

IV. RESULT AND ANALYSIS

4.1. Unit Root Test

After estimating the ordinary least squares (OLS), we proceed to test for stationarity or unit roots of our variables. Running a regression on nonstationary data produces inaccurate outcomes because the estimates derived from such data have nonconstant mean and variance. To ensure that the results produced were not false, the study aimed to establish the stationarity of the data or the sequence in which they were integrated. The Augmented Dickey Fuller (ADF) method was utilized to look for unit roots.

Table 1

Unit root test

Variables	Adj. t- stat (at level)	Adj. t-stat (at first difference)	Conclusion
FDI	-2.8317(0.0709)	-8.4799(0.0000)	I (1)
GDP	-4.6192(0.0019)	-	I (0)
Inflation	-2.5666(0.1153)	-5.1753(0.0006)	I (1)

Source: Output from collected data analysis from E-views 12

From the above table it indicates that FDI and Inflation is stationary at first difference because its p-value at the first difference is less than 5% as well as GDP is also stationary because the p-value at level is less than 5%. Hence, there is mixed-order integration case for the variables I(0) and I(1), which supports the ARDL co-integration strategy.

4.2. Bound Test

According to Pesaran (1997), the long-run relationship of the above equation can be evaluated using the limits test. Regardless of the sequence in which the variables are integrated, if the F-test exceeds their respective critical values, there is evidence of a long-term link between the variables.

Table 2

Bound Test

Level of significance	F-statistic	Lower bound	Upper bound
10%	8.9530	2.63	3.35
5%		3.1	3.87
2.50%		3.55	4.38
1%		4.13	5

Source: Output from collected data analysis from E-views 12

In the Table 2 the calculated F-statistics is 8.9530 which is higher than both the lower bound and upper bound values in all level of significance. This shows that the rejection of null hypothesis that there is long run relationship among the variables. In other words, there is long run relationship among the variables. Thus, the concerned variables are co-integrated.

4.3. Autoregressive Distributed Lag (ARDL) Model

Table 3

Autoregressive Distributed Lag (ARDL) Model

Variables	Coefficient	T-Value	P-Value
FDI	7.5013	2.6614	0.0196
INF	-0.1648	-0.8920	0.3886
C	11.2596	5.2063	0.0002

R2=0.5631	Akaike Info Criterion=4.3848
Adjusted R2=0.3951	Schwarz Criterion =4.6831
F-Statistics=3.3518 (0.0365)	Durbin Watson Stat=2.4119

Note: P-value and any subsequent tests do not account for model selection

Source: Output from collected data analysis from E-views 12

The result of table 3 shows that FDI has positive and statistically significant relationship with Gross Domestic Product in the long run. Similarly, inflation has a negative and statistically insignificant relationship with Gross Domestic Product in the long run.

According to the Table 3, the ARDL results indicate that there is a positive correlation between GDP and FDI. The analysis of annual time series shows an R-square of 0.5631, or 56.31%, indicating that the independent variables (FDI, INF) explain 56.31% of the model's explanation, with the remaining factors determining for the other variables.

Furthermore, adjusted R-square is 0.3951 or 39.51%, indicating the goodness of fit in addition to other independent variables. Higher R-square is generally thought to be better because it explains more about independent variables and their relationships with dependent variables. The whole model is statistically significant because the prob(F-statistics) is 0.0365 and less than the 0.05 standard of significance.

The FDI's coefficient is 7.5013, which is positive and statistically significant to GDP, which indicates that 1% change in FDI results 7.5013 increases in GDP in long run. Whereas the coefficient of INF is -0.1648 which is negative and statistically insignificant.

4.4. Error Correction Model Representation for the Selected ARDL Model

Table 4

Error Correction Model Representation for the Selected ARDL Model

Dependent Variable: (GDP)				
Variables	Coefficient	standard of error	T-value	P-value
D(GDP(-2))	0.7001	0.2156	3.2473	0.0064
CointEq(-1)	-0.8235	0.4252	-6.6390	0.0000
R2=0.8133				
Durbin Watson stat=2.4119				
Adjusted R2=0.7900				

Source: Output from collected data analysis from E-views 12

Table 4 presents the result for short term error correction model for GDP. The coefficient of the error correction term is negative and statistically significant, indicating the evidence of co-integration among the GDP in the model. The comparatively lower value of the error correction term for GDP implies relatively lower rate of adjustment in GDP when shocks arise. The coefficient of error correction term (i.e.; -0.8235) implies that about 82.35 % of total adjustment takes annually when shock arises.

Since the error correction term, cointeq (-1) is negative and significant, this implies that the results support the existence of a long run between the variables. The coefficient of 0.8235 denotes that 82.35 percent of any past deviations will be corrected in the current period.

4.5. Diagnostic Test

Table 5

Diagnostic Test	Obs.R2	P-value	Decision rule
Breusch- Godfrey Serial Correlation LM Test	4.1472	0.2581	No serial correlation
Heteroskedasticity Test	4.2277	0.6044	No Heteroskedasticity autocorrelation
Jarque- Bera Test	2.3647	0.3065	Residuals are normally distributed

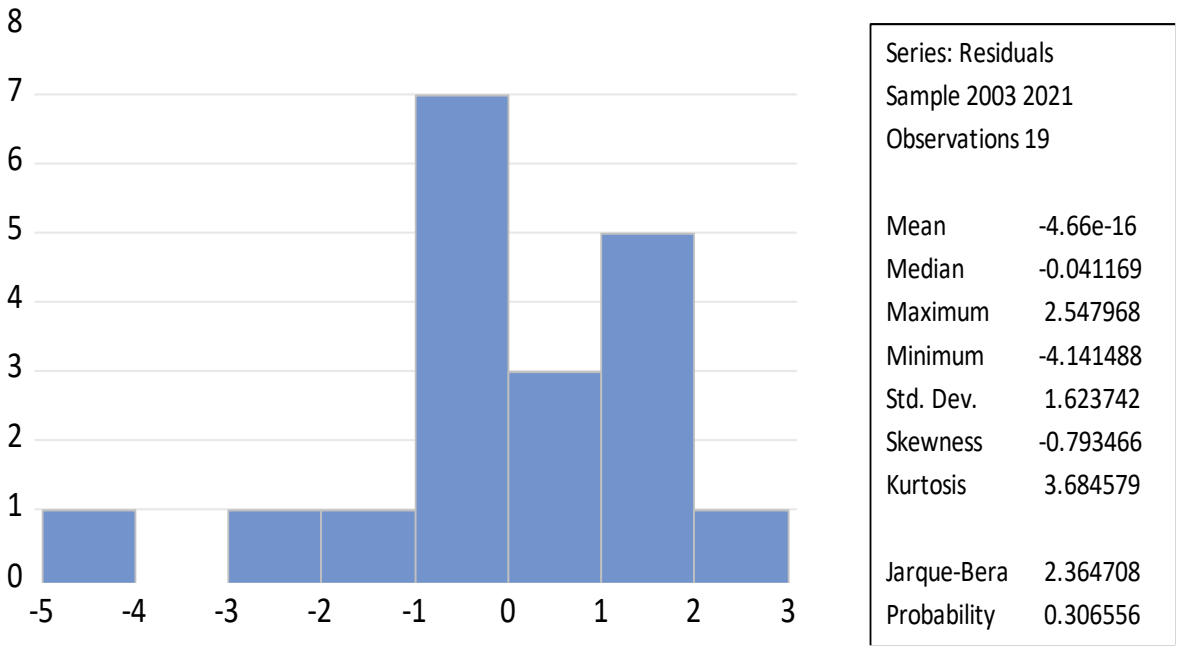
Note: Output from collected data analysis from E-views 12

The diagnostic tests against serial correlation (Breusch-Godfrey test), heteroscedasticity (White), and normality of errors (Jarque-Bera test) showed the insignificant at 5% level which revealed that there is no serial correlation; free from heteroscedasticity and autocorrelation; and normally distributed residuals. These results confirmed that the regression model was fit to predict the relationship between government expenditure and economic growth.

4.6. Normality Test

Figure 1

Normality Test



Source: Output from collected data analysis from E-views 12

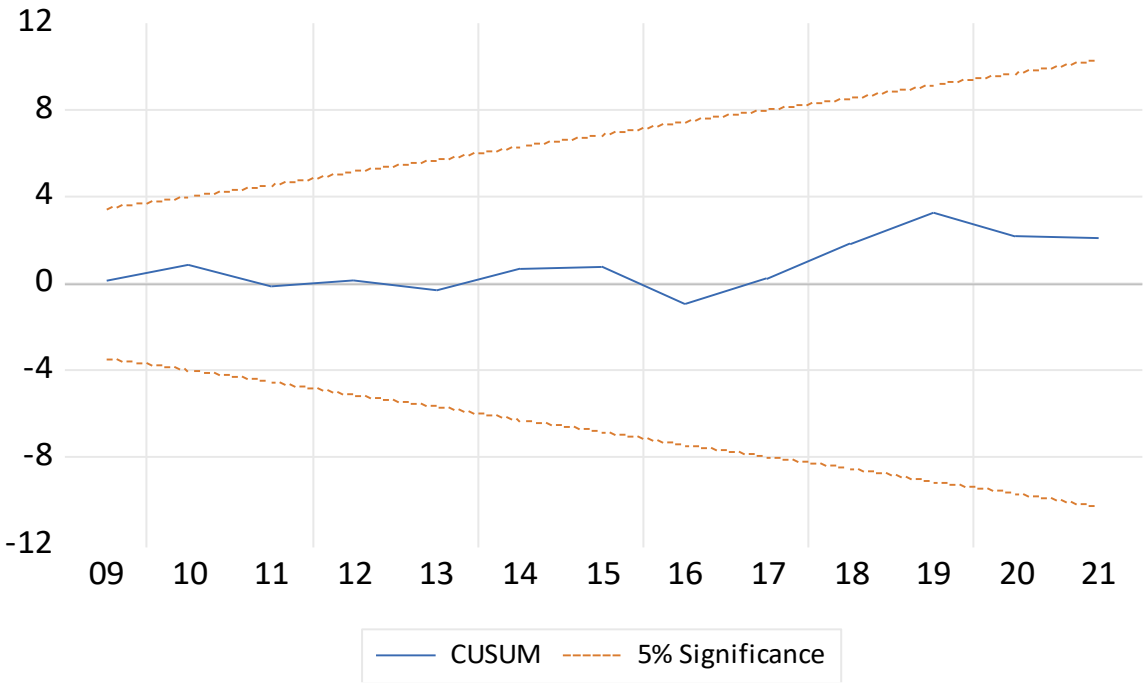
The above figure 1 illustrates that the residuals were normally distributed. In the above figure value is 0.30655 which is less than p-value that is 0.05% which indicates that the alternative hypothesis is accepted whereas null hypothesis is rejected.

4.7. Stability Test

The stability of the long -run parameters together with short run movements for the estimated equations should be examined. For this the thesis relied on cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMSQ) tests proposed by (Borensztein et al., 1998). The test applies to the residuals of the ECM. The graphical presentation of CUSUM test is given in Figure 2.

Figure 2

Cumulative Sum of Recursive Residuals (GDP)

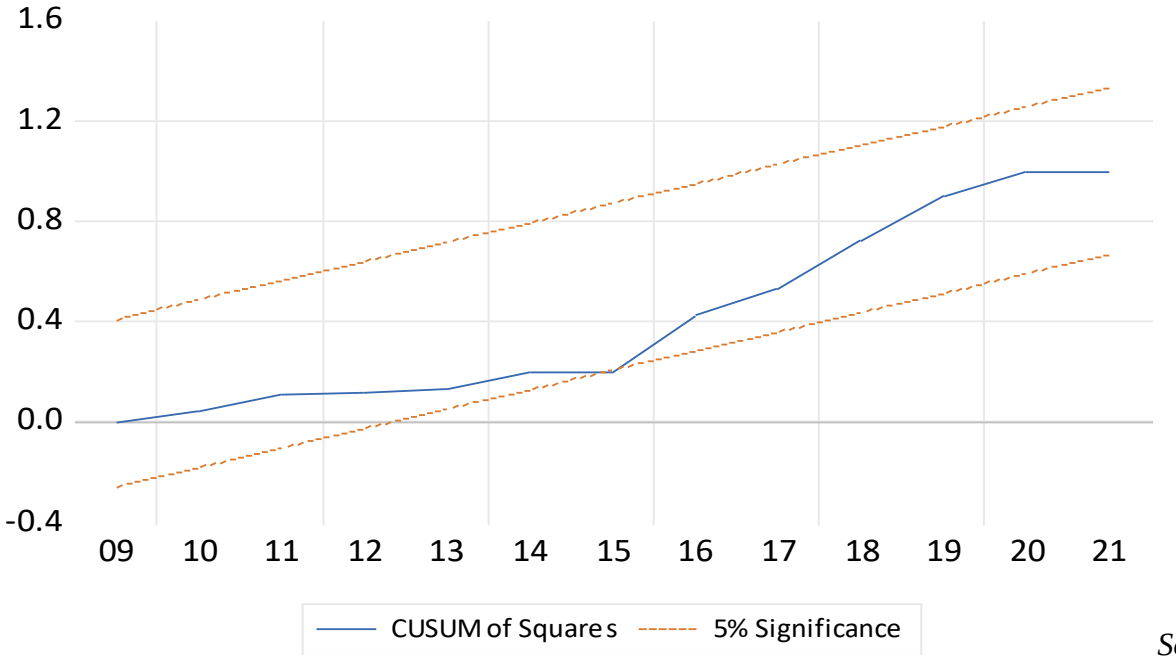


Source: Output from collected data analysis from E-views 12

Since, the plots of CUSUM statistic for GDP are within the critical lines at the 5% significance level, long run coefficient of the GDP function is stable. Similarly, the graphical representation of the CUSUMSQ is given in Figure 3.

Figure 3

Cumulative Sum of Square of Recursive Residuals (GDP)



Source:

Output from collected data analysis from E-views 12

Since, the plots of CUSUM statistic for GDP are within the critical lines at the 5% significance level, long run coefficient of the GDP function is stable.

V. DISCUSSION

This paper examines the relationship between the Foreign Direct Investment, Inflation and Gross Domestic Product in Nepal from 2000-2020. ARDL model results show evidence of the long run relationship between Foreign Direct Investment, Inflation and Gross Domestic Product of Nepal. Based on the findings of the study it determines that FDI has positive and statistically significant relationship with Gross Domestic Product in the long run. The result is supported by the result of Pokharel and Pokharel (2019), Wai Mun et al. (2010) and Bista (2005), which shows that there is significant relationship between Gross Domestic Product and Foreign Direct Investment inflows. Similarly, inflation has a negative and statistically insignificant relationship with GDP in the long run. This result supports with the result of Barro (1995), Kasidi & Mwakanemela, (1975) and contradicts with the result of (Paudyal, 2014).

VI. CONCLUSION

This study investigated the relationship and effect of Foreign Direct Investment, Inflation and Gross Domestic Product in Nepal using the time series annual data from 2000 to 2020 applying the ARDL to co-integration approach. From the study, we got that Foreign Direct Investment has positive relationship and significant effect on growth in GDP respectively and, inflation has a negative and statistically insignificant relationship with economic growth. Thus, it can be concluded that there is a need for a stable political and economic environment, as well as improvements in essential infrastructure and security in the country. Foreign direct investment (FDI) includes new technologies, managerial practices, funding, and market access for the production and transfer of goods and services. According to Thirlwall and Barton (1971), Sergii (2009), and Bhatta (2021), the average inflation rate for the period under consideration (1975-2019) is 8.31 percent, which is detrimental to economic progress. To summarize, our analysis suggests that, in order to increase production growth in Nepal, the government and central bank should conduct expansionary monetary policy while striving to keep inflation at a moderate level.

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