

Effect of FDI on economic growth of least developing countries - evidence from Bhutan

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Abstract

The aim of this paper is to investigate the causal relationship between Foreign Direct Investment (FDI) and economic development in Bhutan. To achieve the objective of the study, we employ the FDI data in the context of Bhutan from the year 2002 to 2017 (15 years). Johansen's Co-integration test has been employed to test if there exists bidirectional causality between FDI and economic growth. Unit root test is used to check if the time series data is stationary. Further, Vector error correction model is used to investigate the causal relationship between FDI and economic growth in the context of Bhutan. The results indicated that there is a long run association between Gross Domestic Product and Foreign Direct Investment in the context of Bhutan as displayed by Johansen's Co-integration Test. Vector Error Correction Model results document that there exist neither short run nor long run causality running from FDI to Gross Domestic

Product (GDP) in the context of Bhutan. Due to non-availability of FDI inflow data before 2002 in the context of Bhutan, the study focuses on the period from 2002 onwards till 2017. The relationship between FDI and economic growth has been the most researched area in literature. This relationship has been studied in the context of single country as well as group of countries. There have been studies carried out in this area in the context of South Asian Association for Regional Cooperation (SAARC) Nations, excluding Bhutan. Therefore, through this study, we make an attempt to fill the research gap existing in the literature. The findings of this study are validated with the results of the relationship between FDI inflows and economic growth of least developed nations.

Keywords: FDI, Economic growth, Johansen's Co-integration test, VECM, Bhutan

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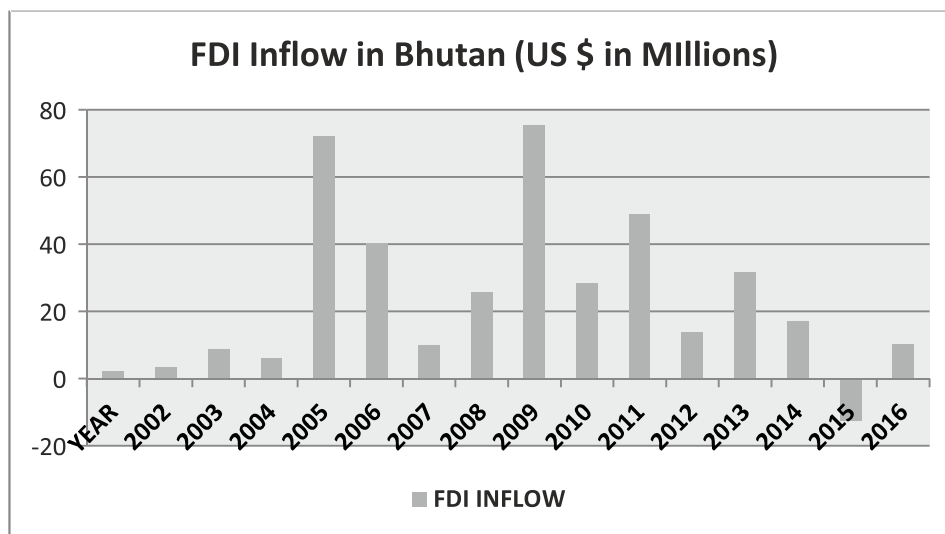
Introduction

Foreign Direct Investment (FDI) refers to the investment made by foreign enterprises in the host country. Most of the developing nations look for foreign direct investment to boost economic development of their country. FDI refers to capital inflows from abroad that are invested in or to enhance the production capacity of the economy. FDI means the investment made to acquire a lasting management interest (normally at least 10% of voting stock) in a business enterprise operating in a country other than that of the investor's residence country (World Bank, 1996). These investments could be either in the form

of Mergers and Acquisitions (M&As) across borders, investments in greenfield projects or even capital transfer between holding and subsidiary company.

Economic growth relates to the growth in the gross domestic product (GDP) of the country. It means the aggregate value of goods and services produced in the country. The growth in GDP is linked to the productivity of the country - how effectively and efficiently it can manage its inputs of land, labour, material and capital to achieve higher productivity (Almfraji and Almsafir, 2014). Bhutan is a developing nation and is mainly an agrarian economy.

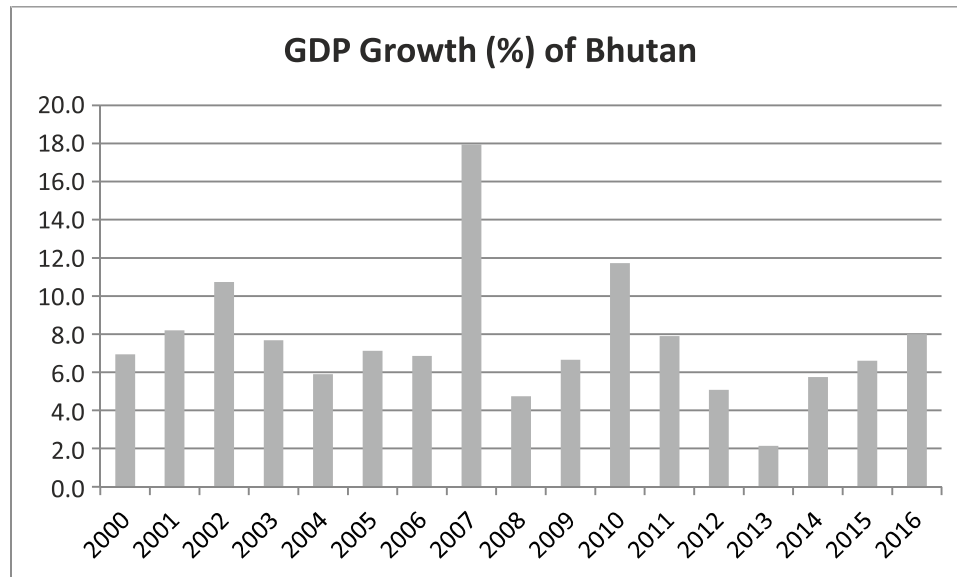
Exhibit 1: FDI Inflow in Bhutan (US \$ in Millions)



Source: Author's Compilation (Data: UNCTAD)

Exhibit 1 displays the FDI inflow in Bhutan (in US Million Dollars) since the year 2002. FDI inflow data is not available with respect to Bhutan prior to the year 2002.

Exhibit 2: Growth in Gross Domestic Product of Bhutan (in Percentage)



Source: Author's Compilation (Data: UNCTAD)

Foreign direct investment (FDI) is mostly linked to the economic development of any country. FDI has multiple effects on the economy of the host country such as infusion of capital, which leads to infrastructure development; thereby it provides employment opportunities which ultimately lead to GDP growth. The host country is able to attract FDI from various nations by exhibiting economic growth in terms of GDP. Hence, this study considers the causal relationship between FDI and economic growth with reference to Bhutan as a least developing economy. Level of FDI attracted by Bhutan since 1970 till 2002 was mediocre (UNCTAD Report); FDI has increased since then.

Review of Literature There is ample literature available on the relationship between FDI and economic growth of the country. Studies have been carried out for particular nations viz., Nigeria (Ayanwale, 2007), China (Hong, 2014), Malaysia (Fadhil and Almsafir, 2015), India (Chakraborty and Nunnenkamp, 2008) as well as for groups of nations viz., 24 developing countries (Nair-Reichert and

Weinhold, 2001), South Asian Association for Regional Cooperation (SAARC) (Alam and Zubayer, 2010, Srinivasan et al, 2011), South Asia (Athukorala, 2014), Industrial countries to 69 developing countries (Borensztein et al, 1998), Middle East and North Africa (MENA) Region (Omri and Kahouli, 2014). Ayanwale (2007) concluded that FDI has a positive impact on economic growth in Nigeria. Hong (2014) re-evaluated the effect of FDI on economic growth in China considering 254 prefecture level cities in China, and concluded that FDI exerts a positive impact on economic development in China. Fadhil and Almsafir (2015) studied the role of FDI inflows on Malaysian economic growth. Their study revealed that FDI inflows together with human capital development contribute strongly to economic growth in Malaysia. Chakraborty and Nunnenkamp (2008) conducted sectoral analysis of the impact of FDI on India's economic growth. The study concluded that the growth effects of FDI vary widely across sectors. FDI in the service sector contributed to growth in the manufacturing sector through cross-sectional spillovers. Alam and Zubayer (2010) studied intra-

regional FDI prospects in the SAARC region. Athukorala (2014) examined the trends and pattern of intra-regional FDI in the SAARC region. The empirical evidence suggested that horizontal FDI has continued to dominate South-Asian Intra-regional FDI. Borensztein et al (1998) examined the effect of FDI on the economic growth of 69 developing countries. The results concluded that FDI contributes to the economic growth relatively more than domestic investment due to the transfer of technology. Srinivasan et al (2011) investigated the causal nexus between FDI and economic growth in SAARC countries. The findings revealed that there exists long run relationship between FDI and GDP of SAARC nations. Hossain (Undated) examined the causal relationship between economic growth, electricity consumption, export values and remittance for the panel of three SAARC countries. The findings displayed bi-directional short-run causal relationship between economic growth and export values, but there is no evidence of long-run causal relationship. Omri and Kahouli (2014) analysed the inter-relationship between FDI, domestic capital and economic growth in 13 MENA countries. The results showed that there is bi-directional causal relationship between FDI and economic growth, and domestic capital and economic growth. The study also revealed that there exists a unidirectional causal relationship between FDI and domestic capital in the MENA region. Abbas et al (2015) examined the relation between FDI and economic growth in 65 countries using panel data. The findings show disparity in terms of relationship between co-integration of the panel. The findings also reveal the unidirectional causality from FDI to economic growth. Hermes and Lensink (2003) argued that development of the financial system plays a greater role in attracting FDI and thereby promoting the growth of the country. Wang (2009) studied the sector level FDI inflow in the country's economic growth. The findings of the study revealed that FDI inflow in the manufacturing sector has a positive effect on the economic growth of the country. Li et al (2020) studied the connection between economic growth (GDP) and environmental conditions (carbon-dioxide emissions) from Ghana.

The study revealed that economic and human activities have a negative impact on the environment and nation. The study further revealed that there is unidirectional causality between growth per capita and carbon emissions. In our study, we make an attempt to investigate the impact of FDI in the developing nation of Bhutan. There have been studies carried out on the effect of FDI on the economic growth of the SAARC nations, excluding Bhutan; therefore, we try to fill the research gap existing in the present literature. The objective of the study is to analyse the relationship and impact of FDI on the economic growth of Bhutan. Research implication of this study is, it would contribute to the existing literature on FDI and economic growth in case of a least developed nation and also examine if the present study results are in line with the existing literature.

Data and Methodology

Design/methodology/approach: To achieve the objective of the study, we employ the annual FDI data in the context of Bhutan from the year 2002 to 2017 (15 years). Economic growth is measured using GDP figures. GDP per capita is considered to be a dependent variable. Period of the study ranges from 2002 to 2017 as there has been a significant and constant amount of FDI inflow in Bhutan since the year 2002. In order to achieve the stated objectives of the study, annual series of inflow of FDI and GDP data is obtained from UNCTAD database. E-views 8 statistical software has been used to perform the econometric analysis. The time-series data is tested for stationarity using ADF (Augmented Dicky-Fuller Test) and PP (Phillips Perron Test).

ADF (Augmented Dicky-Fuller Test): is a unit root test to test the stationarity of the time-series data. The hypothesis for the ADF unit root test is - Null Hypothesis (H0): There is a unit root. Alternate Hypothesis (H1): The time series is stationary.

Phillips-Perron test: PP test statistic is viewed as more robust than ADF test to serial correlation, heteroskedasticity and auto-correlation. The hypothesis for the PP unit root test is - Null Hypothesis (H0): There is a unit root. Alternate Hypothesis (H1): The time series is stationary.

Johansen's co-integration test has been employed to test if there exists bidirectional causality between the FDI and economic growth, and to test whether there exists a long term relationship between the two variables.

Johansen's Co-integration test: is used to determine if two or more time series are co-integrated. The hypothesis for Johansen's Co-integration test is - Null Hypothesis (H0): There are no co-integrating equations. Alternate Hypothesis (H1): The number of co-integrating equations is at least 1.

Vector Error Correction Model: VECM model is a restricted VAR designed to be used for co-integrated non-stationary series. It incorporates error correction term that represents a percentage of correction in the deviation in the long run equilibrium and also depicts how fast the deviations in the long run equilibrium can be corrected. Vector Error Correction Model (VECM) is used when co-integrated equation is detected between the variables. It means that there exists a long term relationship between them. Therefore, we use VECM to analyse the short term properties of co-integrated series. If the coefficient of VECM is negative and significant, there will be long run relationship between independent and dependent variables.

Empirical AnalysisThe analysis presents the Summary Statistics of the selected variables, that is, FDI_Inflow and GDP_PER_CAPITA to test the normality of the distribution (Exhibit 3).

Exhibit 3: Summary Statistics

	FDI_INFLOW	GDP_PER_CAPITA
Mean	23.89	105292.10
Median	15.40	92660.83
Maximum	75.54	203845.80
Minimum	-12.66	43050.87
Std. Dev.	24.85	52666.89
Skewness	0.85	0.48
Kurtosis	2.88	1.94
Jarque-Bera	1.92	1.36
Probability	0.38	0.51
Observations	16	16

Augmented Dicky-Fuller and Phillips-Perron tests are employed to convert the non-stationary data into stationary data.

Unit Root Test: Augmented Dicky-Fuller unit root test and Phillips-Perron test have been employed to check the stationarity of the data. The FDI inflow and GDP data have been converted into log values to bring normality in the data. The results are presented as under:

Exhibit 4: Results of Augmented Dicky-Fuller unit root test and Phillips-Perron Unit root test

Country	Variables	Augmented Dicky-Fuller Test Phillips Perron Test	
		Levels	
		Trend	Trend
Bhutan	Log_FDI	-2.68	-2.95
	Log_GDP	0.04	0.04
First Difference			
Bhutan	Log_FDI	-3.22*	-5.26*
	Log_GDP	-3.58*	-3.65*

* Indicates significance at the 1 per cent level; Optimal lag length is determined by the Schwarz Information Criterion (SC) and Newey-West Criterion for the Augmented Dickey-Fuller Test and Phillips-Perron Test respectively. Exhibit 4 presents the results of the unit root test performed on the data using ADF and Philips Perron tests. The results indicate that, null hypothesis (selected variable has a unit root) was not rejected at levels in case of log FDI and log GDP values in case of the least developing country, Bhutan. But, when the series are first differenced, both the series are found to

be stationary and integrated at the order of one $I(1)$. As both the data series, log FDI and log GDP, are integrated at the same order (1), Johansen's Co-integration test was employed to test if there exists a long run relationship between Foreign Direct Investment and Economic Growth in Bhutan.

[Optimum Lag would be 1 and hence, we use this lag 1 in Johansen's Co-integration Test and Vector Error Correction Model]

Exhibit 5: Results of Johansen's Co-integration Test

Country	Vector (r)	Trace Statistics	5% Critical value for Trace statistics	Max-Eigen Statistics	5% Critical value for Max-Eigen Statistics	Remarks
Bhutan	H0: r=1	19.74*	15.49	16.23*	14.26	Co-integrated
	H1: r?1	3.50	3.84	3.50	3.84	

*indicates 5% level of significance. r is the number of co-integrating vectors. Null hypothesis (H_0) represents there is no co-integrating vector and H1 is an alternative hypothesis that indicates presence of co-integrating vector. Exhibit 5 reveals the results of Johansen's Co-integration test employed for testing the number of co-integrating equations. Two test statistics are reported, namely, Trace statistics and Maximum Eigen value statistics. Both are significant at 5% level of significance, which reveals an existence of co-integrating equation. The result indicates that there is 1 co-integrating equation between variables. It

means there is a long run association between the two variables, that is, GDP and FDI, in the context of Bhutan. Further, we employ Vector error correction model (VECM) as there exists a co-integrating equation between the two variables. It is evident from the above results that there exists a long term relationship between FDI and economic growth of Bhutan. VECM explains the short run adjustments of co-integrated variables towards their equilibrium values. VECM allows modelling of short-run and long-run dynamics for the variables.

Exhibit 6: Results of Vector Error Correction Model determining the causal relationship between FDI and GDP Growth in Bhutan

$$D(\text{LOGGDP}) = C(1)*(\text{LOGGDP}(-1) - 2.71836673066*\text{LGFDI}(-1) - 2.69391538362) + C(2)*D(\text{LOGGDP}(-1)) + C(3)*D(\text{LOGGDP}(-2)) + C(4)*D(\text{LGFDI}(-1)) + C(5)*D(\text{LGFDI}(-2)) + C(6)$$

$$D(\text{LGFDI}) = C(7)*(\text{LOGGDP}(-1) - 2.71836673066*\text{LGFDI}(-1) - 2.69391538362) + C(8)*D(\text{LOGGDP}(-1)) + C(9)*D(\text{LOGGDP}(-2)) + C(10)*D(\text{LGFDI}(-1)) + C(11)*D(\text{LGFDI}(-2)) + C(12)$$

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.012774	0.012347	-1.034579	0.3408
C(2)	-0.773281	0.569897	-1.356879	0.2236
C(3)	-0.081337	0.471550	-0.172489	0.8687
C(4)	0.002396	0.022376	0.107063	0.9182
C(5)	0.009667	0.011376	0.849782	0.4280
C(6)	0.201057	0.099699	2.016644	0.0903
R-squared	0.465278	Mean dependent var	0.110347	
Adjusted R-squared	0.019677	S.D. dependent var	0.031718	
S.E. of regression	0.031404	Akaike info criterion	-3.776882	
Sum squared resid	0.005917	Schwarz criterion	-3.534429	
Log likelihood	28.66129	Hannan-Quinn criter.	-3.866647	
F-statistic	1.044158	Durbin-Watson stat	1.936969	
Prob(F-statistic)	0.470211			

If C(1) is negative and p value is significant, that means there is long run causality running from FDI to GDP. In these results, it is evident that there is no long run causality running from FDI to GDP. Therefore, we check for short-run causality. To check short run causality, we run the Wald test.

Wald test

The table shows the test of joint significance of variables using Wald test.

Test statistics	Value	Df	Probability
F-statistic	0.265546	(1, 8)	0.6203

The two variables are significant based on the VECM equation namely, LogFDI and LogGDP. The probability value of F-statistic is more than 0.05; so, we accept the Null hypothesis stating that there is no short run causality running from FDI to GDP.

Applicability

The findings of this study are applicable to least developing nations like Nepal, Tibet, Myanmar, Maldives and Sri Lanka. These nations have cultural similarities and also potential for growth in the tourism industry. The growth potential of this industry would attract potential foreign investors in the form of Foreign Direct Investment and lead to economic growth of the country.

Generalizability

The research available on FDI and economic growth in developed nations has proved the existence of a positive relationship between FDI inflows and the country's economic development. The findings of this study validate the results pertaining to the positive relationship between FDI inflows and economic growth with respect to developing nations.

Conclusion

In this paper, we made an attempt to study the impact of Foreign Direct Investment (FDI) on the economic growth of the least developing country, Bhutan. The data was collected from 2002 to 2017 (15 years) from UNCTAD website on FDI inflow and GDP of Bhutan. We employed Johansen's Co-integration Test to test if the variables are co-integrated with each other. The results displayed that variables GDP and FDI are co-integrated at order I. The results indicated that there is a long run association between Gross Domestic Product and Foreign Direct Investment in the context of Bhutan. Further, we employed Vector Error Correction Model (VECM) to test the short run adjustments of co-integrated variables towards their equilibrium values. From the results, it is evident that there is no long run causality running from FDI to GDP. The Wald test was employed to test if there exists a short run causality running from FDI to GDP. The results documented that there exists no short run causality between the two variables.

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