

FOREIGN DIRECT INVESTMENT AND ECONOMIC GROWTH FOR INDIAN ECONOMY: AN ECONOMETRIC ANALYSIS

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Abstract: FDI has been playing a major role in the process of economic growth for major countries across the world including India. It has been an important contributor to growth of Indian economy for long and India still considers FDI as sole factor for Indian economy and keeps reforming FDI policy over the time for leading to benefits of economic growth. Therefore, the study attempts to analyze the causal relation between FDI and economic growth and its long term association in India by applying Granger causality and cointegration approach for the period 1991-92–2019-20. The cointegration results indicates that there exists cointegration at the 0.05 percent level of significance between GDP and FDI. Causality test also showed that the both variables have causal relation in Indian Economy in the sense that FDI causes India's GDP growth. The result asserted that the positive relationship between these two appear to be both reinforcing under the structural reform over the period. However, although India focused on reforms for attracting FDIs, but may also have to be very strategic in targeting the FDIs which can raise the FDIs and improve its quality by maintaining investor friendly environment with focusing on infrastructure, tax concession and effective trade policy etc to attract the higher FDI inflows.

Keywords: Economic growth, FDI, stationary test, Cointegration test, causality test.

JEL: F43, F21, O21

INTRODUCTION

FDI has been playing a major role in the process of economic growth for major countries across the world including India. FDI has also been seen major contributor to growth of Indian economy for long and India still considers FDI as sole factor for it and keeps relaxing FDI policy over the time and continued to encourage FDI into country. However, India was very successful in attracting FDI into economy, which contributed a lot to GDP and played vital role in Indian economy. There are many studies which have found the evidence about the significant relationship between FDI

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and economic growth in India as it supplements capital, transfers knowledge, and brings new technology as found in the study (Farrell, 2008). FDI and technology have been seen to have long-long-term impact on economic development in the case of developing countries including India through transfer of technology and spillovers.

FDI had become an important strategic component of investment by the Government of India for faster economic growth.¹ To continue to achieve this objective the successive governments have been continuing with the structural reforms and playing as proactive role in investment promotion, by allowing 100% FDI in most of the sectors/activities. As a result, there have been more FDIs rapidly entering into country in various forms and into various sectors and promoting business. Srinivasan, P., Ibrahim P., and Kalaivani, M. (2011) attempted to investigate empirically the link between the two variables such as GDP and FDI in the case of SAARC countries and found that both variables have a long term causal connection for SAARC countries except India and confirmed that FDI had beneficial effects on economic growth. According to International Monetary Fund (IMF)², India has been growing very fast with GDP growth rate above 7.6% in 2015-16, and projected to grow more than 7% till 2020. India had grown at 6.8% of GDP growth in the last decade with FDI to GDP ratio at nearly 1.8%.³ FDI to GDP ratio could be expected to increase that may be due to current structural reforms which raised the FDI limits in multiple sectors. The several factors of Indian economy such as high GDP, huge consumer base, abundant labor force, and government reforms that are main factors which have provided ample scope for opportunities to the foreign investors which can create value chains with significant linkages within India only.⁴ FDI restrictions level in India have been gradually come down. This has led to a large improvement in FDI inflows. But as per the most recent Economic Survey, the amount of Foreign direct investment (FDI) inflows in India has been seen rapidly increasing after the launch of Make in India scheme⁵. Therefore, FDI is still very important and the economic growth of India perhaps might need the backing of FDI in coming years. In this backdrop, the present study aims to examine the causal connections between FDI) and GDP growth over the structural reforms period from 1991-92 to 2019-20. Therefore, in this context, this study tries to investigate the long term causal relationship between FDI and GDP growth in India over the reforms period from 1991-92 to 2019 -20.

AN OVERVIEW OF FDI AND ECONOMIC GROWTH IN INDIA

Since, the study wants to examine the causal association between foreign direct investment and economic growth, this considers to show the time

series data on FDI and GDP of country and calculates FDI to GDP ratio for India to get to know its nature and linkage during the period from 1991-92 to 2019-20. Chakraborty, Mukherjee, (2013) analyzed the growth effects of FDI on GDP and revealed that their effects are less marked in the in the short run. Further, Agarwal and Khan () in their study they examined the Impact of FDI on GDP and compared between China and India". They found that there is a 0.07% increase in GDP by every 1% increase in FDI for China and 0.02% increase in GDP for India. India has been consistently reforming the FDI policy since 1991 to invite more foreign investments into the country for development. This has resulted in consistent increase of FDI inflows into the country over the last three decades with some up and down in some particular years. However, FDI has been seen consistent rise with doubling from \$36 billion in 2013-14 to \$ 74.4 billion in 2019-20 (DIPP). With the higher inflows of FDI, India's economy is expected for higher growth in the future. Again, India grew at a GDP growth of 6.8% with FDI to GDP at around 1.8% in the current decade.⁶ Therefore, this study estimates FDI to GDP ratio for the period from 1991-92 to 2019-20 that may tell the link between these two variables. The following figure presents the picture of FDI to GDP ratio.

Table 1 shows the graph on estimation FDI to GDP ratio in India over period from 1991-92 to 2019-20. This shows that the FDI to GDP ratio as percentage was found less than one since 1991 to up to 2005-06 and afterword's it started rising (see the appendix 1). However, the FDI to GDP ratio as percentage was estimated as 0.794% in 2002-03 and increases to 3.44% in 2008-09. but the ratio declined in 2009-10 that may be due to global financial crisis. This showed that amount FDI in India were seen a continuous rise and also FDI as percentage of GDP. But after financial year

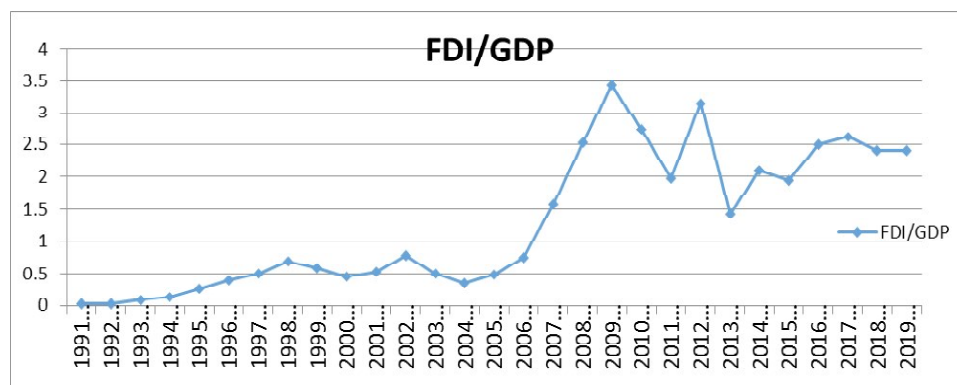


Figure 1: FDI to GDP ratio during the period 1991-92 to 2019-2020

Source: Computed by Authors.

2009-10 it dropped & arrived at 1.421% in 2013-14. Further, the ratio was 1.906% in the 2016-17 which was highest in the last six years during 2014-15 to 2019-20. The FDI to GDP ratio for the period from 1991-92 to 2019-20 showed a rising trend with some up and down in some years. This implied that both the variables such as FDI and GDP may have very much link for Indian economy. As FDI has been increasing into the country with greater speed, the higher FDI to GDP ratio can be expected and that may have great potential for boosting growth in the economy. Therefore, the study has proposed the direction for conducting a long run analysis.

REVIEW OF LITERATURE

A number of studies have been conducted on the link between the inflow of FDI and economic growth in the case of India. The link between inflow of FDI and unit cost of labour, real GDP, and the import duties as a proportion in tax revenue for India have been examined with applying cointegration technique by (Chakraborty and Basu, 2002). They found two long – run equilibrium relationships. Kiran, S., Baig MM, and Bilal M (2016) examined the long term association between the two variables such as FDI and GDP for South ASIAN countries like India, Nepal, Pakistan, Maldives and Bhutan, with applying using time series models such as co-integration and granger causality test. It was found from results that there were cointegration relation in the series at the 5 % level. The result shows that FDI granger cause GDP in the country like Nepal and FDI contributes to economic growth in developing countries. Technology spillovers enhanced firm productivity at the firm level, (Zhou, Li, & Tse, 2002). The priority for inviting FDI have been emphasised as one of their main focuses in the economic growth and development in developing countries (Vo *et al.* 2019a). The focus of FDI inflows into the developing countries mainly due to its positive effects during the globalization (Demirsel *et al.* 2014).

However, there are several nations which they have their own unique advantages and disadvantages and strengths and weakness to work towards economic growth. FDI is has been very important for maintaining financial stability, economic growth, global integration, and social welfare (Borensztein *et al.* 1998; Nguyen *et al.* 2019). Another recent study done by Pegkas, (2015) reported that FDI has been stimulating economic growth in the Eurozone. Kashibhatla and Sawhney, (1996) supported one directional causality between GDP and FDI in the case of USA, but not the reverse as this this may be due to the fact GDP is an indicator for market size for a developed country. It is evident from many empirical studies that FDI contributes positively to growth in recipient countries. Hence, major developing countries designs various suitable FDI policies to attract more

and more FDI into country with a purpose to supplement domestic capital, technology and skill to boosting higher growth. India is one such example of among the developing countries. FDI supports Growth as it was confirmed by many studies. But in some studies, they do not support that the FDI's impact on Growth. For the country like Cambodia, they depend more on FDI which is the important factor of economic growth in its economy. However, it was not fully known about their causal relationship in Cambodia. Sothan, S. (2017) attempted to examine the causal connection between the FDI and GDP growth for the period 1980–2014, with applying causality test. The results reported strong evidence that FDI cause economic growth for Cambodia. However, study does not confirm causality in reverse way. It is well supported that FDI had huge role for growth in the country like Cambodia. Turning to the case of India, it was evident from the analysis that FDI was the sole crucial factor and has been enhancing economic growth in India. However, in some studies it was not, but it might be due to a number of factors. It is also evident in the many studies that, they supported that the FDI impacts growth, but few studies do not support. In case of growth of agricultural output, inward FDI is non contributive. However, output from agricultural sector is found that it attracts more FDI, but on the other hand it has evidenced a reverse causality. **Sankar, Sahu & Pandey, (2019) found an interesting evidence that FDI affects the output in the case of manufacturing sector for the last few years. Sankar, Sahu & Pandey, (2019), their study reported that there is a two way directional causality between FDI and growth for service sector both for the short and long run.**

Mittal and Alam (2014), Maheswari, (2015), and Sahu and Pandey (2018) supported that the FDI supports growth in the India's industrial sector as it was suggested by Chakraborty and Nunnenkamp (2008) in their study. Dua and Rashid, (1998) did not find that the direction of causality from FDI to Index of Industrial Production (IIP), which is the proxy variable for the growth of GDP for the Indian economy. FDI maintains the country's financial stability, technology, entrepreneurship, management and exports, which allowed a business firm to do business and produce goods and services in a foreign country (Farrell, 2008). Sultan, Z.A. (2013) studies FDI and export relationship in Indian economy for the period 1980-2010 with applying co-integration method. The studies found that they have a stable and long term relationship between the two variables in India. Granger causality results also showed that export causes FDI inflow into the country and not vice versa. However, in the short run there was no two way directional causality between them in the sense that FDI inflow neither Granger cause export, nor export Granger cause FDI in the study.

The study conducted by (Agya & Wunuji, 2014) found that neither FDI does Granger cause economic growth in the China's primary sector, nor economic growth does Granger cause FDI in the same sector showing a sector-specific analysis. It was observed from the study that there showed two way directional causality between inflows of FDI and economic growth in secondary sector. Further, the study found a one way directional causality between economic growth and FDI inflows in the service sector of the economy. The similar results were also reported by many other studies (e.g. Vogiatzoglou & Thi, 2016; Tang&Tan, 2016). Okafor (2012) attempts to analyze the effects of pull factors of FDI inflow in the case Nigeria for the time period from 1970 to 2009. The main factors of FDI in the case Nigeria include such as, inflation rate, real GDP, net export, real exchange rate and interest rate in the study. The models conducted in the study were cointegration test and regression analysis. The results found that real GDP had positively affected FDI inflow. The relationship between FDI& GDP growth cannot be generalized as these variables are highly subject to fluctuate with changing institutional, government and regulatory policy environment (Herzer& Klasen, 2008). Rao & Dhar, (2018) pointed out that the main factors responsible in developing countries to attract FDI were the important economic policy measures to give favorable treatment to investors in developing countries. They were also critical about the reported values of amount of inflows of FDI and its benefits and concerned about its quality and finally questioned about the mechanism that to clarify about what the FDI was doing in this country, especially in terms to technology transfer and employment. Ray (2012) tried to examine the link between FDI and the economic growth in several countries including India. This study analysed its relationship by using the cointegration model for the period, 1990-91 to 2010-11 in case of India. Before applying this model, the study checked unit root test only with using (KPSS) test and confirmed that the variables have unit root. The cointegration test found that these two variables have long term relationship. The error correction estimates showed that that the Error-Correction Term was statistically significant and had a correct sign. This test confirmed that there isn't any problem in their long-run equilibrium relationship. The above discussions conclude that the FDI and economic growth relationship are still arguable and can be made for discussion in the case developing country like India. This means that although the impact of FDI on growth is still an issue, however, it had enough evidence from many studies that the FDI variable has a crucial role in enhancing growth because its benefits are seen in the country. This clearly indicated that FDI is still even very important and a lot is yet to come from FDIs in the process of growth in the Indian economy.

DATA SOURCES AND METHODOLOGY

This study uses the secondary data for the analysis. It collects the data on FDI inflows to India and gross domestic product covering the time period from 1991-92 to 2019-20 from various sources. The main sources of these data and information include such as Department for Promotion of Industry and Internal Trade by Ministry of Commerce and Handbook of Statistics on Indian Economy by the RBI Bulletin, Government of India. There are two main variables such as India's economic growth as measured by gross domestic product (GDP) at a constant prices and foreign direct investment (FDI). In order to reduce the problems of heteroscedasticity, the variables are considered in natural logarithms. The study considers to investigate the causal association between FDI and GDP growth in India. In order to examine this above causal relationship between the two variables, the study has taken the model of following form:

$$Y_t = f(X_t) \quad (1)$$

The above equation (1) can be written in the following in an econometric form,

$$\ln Y_t = \beta_1 + \beta_2 \ln X_t + u_t$$

Where,

Y_t is Gross Domestic product (GDP) of country

X_t is FDI inflows

\ln is the natural log of the variables.

't' is time period

u_t = error term

Firstly, the study calculates and shows the descriptive statistics of these variables to know about the nature of the variables in the series. Since, the study attempts to investigate the association between FDI and economic growth of India as a long term causal relationship and to know if bi-directional causality exists, it wants to apply time series analysis such as cointegration and causality test to analyse for the same. The model has two variables-GDP and FDI.

But before doing these tests, the study checked stationary of the time series variables such as GDP and FDI which is essential for drawing meaningful inference and to improve the consistency of the models. Again, the study applies cointegration model to examine their long term causal relationship between the variables selected in the study. Further, the study has tried to use two way causality model developed by Granger to examine

the existence of causal relationship between the above variables. In this backdrop, to test for direction of causality between the above variables, we write the following regression equations:

$$Y_t = \alpha_1 + \sum_{i=1}^k \beta_2 Y_{t-1} + \sum_{i=1}^k \beta_3 X_{t-1} + u_t \quad (3)$$

$$X_t = \gamma_1 + \sum_{i=1}^k \delta_i Y_{t-1} + \sum_{i=1}^k \lambda_i X_{t-1} + u_t \quad (4)$$

Where Y_t and X_t are time series variables such GDP and FDI inflows which are stationary time series. u_t and μ_t are random terms. k is the lag length in the time series AIC variables which is decided by (AIC) in the analysis. If the coefficient β_3 is significantly different from zero, it means that the FDI is Granger cause of GDP. Similarly, if the coefficient δ_i is statistically and jointly significantly different from zero, which means GDP is Granger cause FDI.

RESULTS

Descriptive Statistics

Table 1 presents the summary of descriptive statistics.

Table 1
Descriptive Statistics

<i>Statistics</i>	<i>GDP</i>	<i>FDI</i>
Mean	15.2023	10.385
Minimum	14.128	6.01
Maximum	16.32	12.57
Standard deviation	.795	1.837
Variance	.633	3.375
Skewness	.357	-.499
Kurtosis	1.679	2.42
Jarque–Bera teststatistic	2.672	1.648
Probability	0.268	0.438

Source: Authors calculation.

The descriptive statistics describes the nature and characteristics of the data. The average growth of GDP in country is 15.202. The above descriptive statistic reveals that the average GDP growth rate varies between 14.148 to 16.322 with standard deviation 0.795. The average inflows of FDI from the rest of world are 10.385. It varies from 6.01 to 12.57 in these twenty (1991-92 to 2019-20) years with the standard deviation 1.837.

Unit Root Test

Table 2: Dickey–Fuller (DF) Test

Variables	Level		First Difference	Result
Ln GDP	0.303	5.418	I(1)	
Ln FDI	-1.378	-3.293	I(1)	
Critical Values	1%	3.743	-4.371	
	5%	-2.997	-3.596	
	10%	-2.629	-3.238	

Source: The authors.

Critical values at 10%, 5% and 1% percent levels.

I(1): stationary after first order.

**Table 3
Augmented Dickey–Fuller (ADF) test**

Variables	Level		First Difference	Result
Ln GDP	0.345	-5.776	I(1)	
Ln FDI	-1.378	-3.773	I(1)	
Critical Values	1%	3.743	-4.371	
	5%	-2.997	-3.596	
	10%	-2.629	-3.238	

Source: The authors.

Critical values at 10%, 5% and 1% percent levels.

I(1): stationary after first order.

Unit root tests by **Augmented Dickey–Fuller (ADF) test** confirmed that the time series data is stationary at the level of first difference but not stationary at the level. The null hypothesis (H_0) of no unit root is rejected and implies that they are stationary and integrated of order one, $I(1)$. It is evident from ADF and DF tests that variable bear unit root in their level values which implies that they are nonstationary at level, $I(0)$ and stationary at first difference.

Results of Cointegration Test

Table 4 presents the cointegration test results. As the unit root tests confirmed that the variables bear the unit root at the level values $I(0)$, but they are integrated of order 1 that is, $I(1)$, it considers to apply the cointegration test to establish the long term relationship among them. The tests confirmed that cointegration test is an appropriate technique which can be applied for analysing their long run relationship.

Table 4
Results of Cointegration Test
 (Trace Static: no of observations=27, lags=2)

<i>Hypothesized No. of CE(s)</i>	<i>LL</i>	<i>Eigen value</i>	<i>Trace statistic</i>	<i>5% level</i>
None	13.402	-	15.84	12.53
At most 1	19.463	0.36170	3.7210*	3.84
At most 2	21.323	0.12874		

Source: The authors. Trace test indicates 1 co-integrating eqn(s) at the 0.05 level. Eigen value test claims same at the 0.05 level and greater than the critical values. The above result shows that there is one co integration at 0.05 level. * indicates a level of significance at 5 percent.

Maximum eigenvalue and trace tests rejected the null hypothesis of no cointegration at 5% significance level. Trace statistic test considers the presence of 1 cointegrating equation among these two variables at the 0.05 level. However, the maximum Eigen value test claims same at the 0.05 level and greater than the critical values. However, the two test statistics give the same results. Thus, it rejects the hypothesis of no cointegration at 5% level, indicating long term association between the variables. The optimal lag length chosen by AIC is 2. The results confirmed the long-run cointegrating equation, that there is a positive and significant relationship between the variables, in the long run and they move together in the same direction. This confirms the long-run equilibrium relationship for the period being investigated. Its long term relationship may indicate that here happens at least one-way causality between the variables and rules out spurious correlation

Results of Causality Test

Table 5 shows Granger Causality Test results.

Table 5
Granger causality tests

<i>Equation</i>	<i>excluded</i>	<i>Chi2</i>	<i>df</i>	<i>Prob>chi2</i>
GDP	FDI	1.987	2	0.370
GDP	ALL	1.987	2	0.370
FDI	GDP	5.0153	2	0.081
FDI	ALL	5.0153	2	0.081

Source: Author's own estimate

Ho: has no causality between the variables; H1: has causality between the variables.

The results revealed that the null hypothesis of H_0 is rejected at 5 % level at lag length of 2 and conclude that FDI does Granger Cause GDP. On

the other hand, the opposite is not true. There is one way causality exists between these two variables i.e FDI and GDP as it was also found in various other studies.

CONCLUSION

This study attempts to investigate the causal connection between FDI and India's GDP growth taken as proxy for economic growth for the the period 1991-92 to 2019-20 in structural reform period. Firstly, the study estimates the FDI GDP ratio over the study period and found that they exhibit increasing trend which may indicate that FDI in India may have causal link with GDP. In this context, the study used J-J cointegration test to analyse their long-run association and the causality test by Granger to estimate the causal connection between the two over the study period. The results of cointegration confirmed the long term association between the two at 5 percent level of significance which indicates that there is a effects from FDI to GDP in long run. Further, the causal link between FDI and GDP examined by Granger causality test showed that FDI caused India's GDP growth as similar results obtained by the study (Srinivasan, P., Kalaivani, M& Ibrahim P., 2011). The findings confirms that the relationship between economic growth of India and FDI inflows is very strong and logical under the continuous structural reforms made by the government. The study suggests that India might focus to maintain its investor friendly environment by emphasising on infrastructure, tax concession and effective trade policy etc to attract the higher FDI inflows. However, the study may also suggests that India may also have to be very strategic in targeting the FDI's which can raise the FDI's and improve its quality in the future.

Notes

1. The Industrial Policy in 1991 clarified that the main reason behind the economy to open up for FDI were to "bring related advantages of technology transfer, marketing expertise, introduction of modern managerial techniques and new possibilities for promotion of exports". FDI Policy Circular of 2017 in FDI policy have made it clear that the FDI was mainly there to supplement domestic capital, better technology and enhancing skills to drive economic growth in the country.
2. International Monetary Fund (IMF).
3. CII-EY Survey 2020.
4. CII-EY Survey 2020.
5. 6 Make in India initiative launched by Government of India in 2014, with the purpose for making India a global manufacturing hub. To do so, Government of India tries to encourage **encourage** both multinational as well as domestic companies to **produce** the products within the domestic country. Make in India was to increase the share of manufacturing in GDP by 2025 and the main focus of

it was on 25 sectors. The Prime Minister told “FDI” should be considered as “First Develop India” along with “Foreign Direct Investment.” He told investors to see India as an opportunity, not to look at India merely as a market.

7. CII-EY Survey 2020.

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Appendix 1
Trends of FDI Inflows

<i>Year</i>	<i>FDI FLOWS INTO INDIA (Amount Rs. Crores)</i>	<i>GDP (Amount Rs. Crores)</i>	<i>FDI inflows (as % of GDP)</i>
1991-92	408	1367171	0.03
1992-93	1095	1440503	0.08
1993-94	2018	1522343	0.13
1994-95	4312	1619694	0.27
1995-96	6916	1737740	0.40
1996-97	9654	1876319	0.51
1997-98	13548	1957031	0.69
1998-99	12343	2087827	0.59
1999-00	10311	2254942	0.46
2000-01	12645	2348481	0.54
2001-02	18654	2474962	0.78
2002-03	12871	2570935	0.50
2003-04	10064	2775749	0.36
2004-05	14653	2971464	0.49
2005-06	24584	3253073	0.76
2006-07	56390	3564364	1.58
2007-08	98642	3896636	2.53
2008-09	142829	4158676	3.43
2009-10	123120	4516071	2.73
2010-11	97320	4918533	1.98
2011-12	165146	8736329	1.89
2012-13	121907	8736329	1.40
2013-14	147518	9213017	2.05
2014-15	181682	9801370	1.93
2015-16	262322	10527674	2.49
2016-17	291696	11386145	2.56
2017-18	288889	12196006	2.37
2018-19	309867	1367171	0.03
2019-20	364000	1440503	0.08

Source: Computed by Authers, *FDI Statistics, Department of Industrial Policy & Promotion, Ministry of Commerce & Industry, Government of India, 2015.*