



Causality Between Foreign Direct Investment And Economic Growth In India

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***Abstract**— Foreign direct investment is considered to be a vital component of every nation's attempt towards economic development. It contributes directly to the growth, and facilitates transfer of managerial skills, besides improving global market access. On this background, the present paper investigates the causal nexus between foreign direct investment and economic growth in India. Also, the paper identifies and finds out an explanation for its association. Granger causality Test is employed to examine the causality between FDI and Economic growth in India, for which annual data from UNCTAD (United Nations Conference on Trade and Development) for the year 1995 to 2013 was used. The Granger test reveals a positive relationship from GDP to FDI.*

***Index Terms**— Economic growth, Foreign Direct Investment, Granger Causality, Gross Domestic Product.*



I. INTRODUCTION

Investment in a country by individuals and society from other countries is a vital aspect of international finance. This can take the form of portfolio investment or Direct Investment(FDI) ¹. FDI is an important source of development financing; it contributes to productivity gains by providing new investment, better technology, management expertise and export markets. FDI has become a much desired commodity by nations, regions and cities throughout the world indeed, governments bid for FDI because it is commonly thought to be an important engine of economic growth, job creation, and technological upgrading. According to the United Nations (2001)[1] the countries that usually attract large amounts of FDI are those with good economic conditions, with high level of education, high level of macroeconomic and political stability, constructive growth prospects and favorable investment environments. They are considered to be rapid growing economies.

World (which includes developing and developed economy) FDI inflow registered a rapid growth as shown in the data presented in Table 1. From US \$ 13345 million in 1970, world FDI flows rose to \$ 54086million in 1980 and further to \$ 208092 million in 1990. It reached \$1409011 million in 2000, and there was a drop in 2002 due to the attack on World Trade Center (USA) in September 2001 . It slowly picked up and further increased and reached the peak of \$1351681 million in 2010 and further to \$1383998 in 2013. The share of developed countries rose from 71.12 per cent in 1970 to 86.11 percent in 1980; thereafter it showed a tendency to decline reaching 52.04 per cent in 2010 and then later to 42.31 percent n 2013 implying a rise in the share of Developing Countries (DCs) in the rapidly rising FDI flows. From the table it is clear that the share of FDI in developing countries slowly raises from 1990 onwards.

During the first three decades after independence, foreign investment in India was highly regulated, i.e. there has been a gradual change in the government's attitude to FDI since 1948. Being a resource-poor country, especially in capital resources, India was always receptive to foreign investment. The foreign exchange crisis of 1957-58 led to a further liberalization of the government's attitude towards FDI. However, the government adopted a more restrictive attitude towards FDI in the late 1960s as local industries developed. In 1973, the new Foreign Exchange Regulation Act (FERA) came into force, requiring all foreign companies operating in India to register under Indian corporate legislation with up to 40 percent equity. In the 1980's there was some easing in the foreign investment policy in line with the industrial policy regime of the time. The major policy thrust towards attracting FDI was outlined in new industrial policy statement of 1991. Since then, continuous efforts have been made to liberalise and simplify the norms and procedures pertaining to FDI , i.e., the removal of quantitative restrictions, reducing tariffs and exchange rate flexibility. India launched its second-generation reforms in 2002, with a focus on reducing the fiscal deficit, improving infrastructure, reforming labor laws and energizing the

¹ According to the International Monetary fund, FDI is defined as investment that is made to acquire a lasting interest in an enterprise operating in an economy other than that of the investor. The investor's purpose being to have an effective voice in the management of the enterprise.



states to participate actively in stepping up the pace of reforms. India raised its FDI limits in many important sectors including telecommunication, banking and insurance and civil aviation.

India's FDI inflow registered a rapid growth as shown in the Table 1. From US \$ 45.86 million in 1970, the FDI flows rose to \$ 79.16 million in 1980 and further to \$ 236.69 million in 1990. It reached US \$ 3597.66 million in 2000, further it increased to \$ 28542 million in 2013. Also, the share of India when compared with developing economy is found to have a steady increase 1.18 percent in 1970 to 3.58 percent in 2013.

Global FDI inflows in 2012 had shrunk 18 per cent to \$1.31 trillion due to the weakening macroeconomic environment, slow growth in trade, GDP and employment (Business Line, Jan 29 [2]). There has been tremendous growth in FDI inflows to India since 2003-04. Equity inflows have risen, from US\$ 2.23 billion in 2003-04 to US\$ 27.31 in 2008-09 and US\$ 25.89 billion in 2009-10 (nearly thirteen-fold). Total FDI inflow into India since the onset of the liberalization process (August 1991-May 2010) is nearly US\$ 136.86 billion. This represents only the equity capital component. Under equity capital, reinvested earnings, and intra company loans (international practices of reporting),the figure comes to US \$168.94 billion as against US\$ 6.13 billion in 2001-02, US \$ 35.18 billion in 2008-09, and I further increased to US \$ 21 billion in 2010. India attracted FDI worth \$27.3 billion in 2012 which was 13.5 per cent lower than \$31.5 billion worth of FDI attracted in 2011. Foreign direct investment flow into India in 2013 increased 17 per cent to \$28 billion. According to the UN Conference on Trade and Development (UNCTAD) report for 2013[3], FDI during the year rose 11 per cent to \$1.46 trillion which is the highest since the start of the global economic crisis in 2008.

Studies on FDI are enormous and ranges from simple case studies to cross country comparisons. It is an indisputable fact that a good number of studies have been conducted in the field of FDI. Various theoretical studies have shown that FDI can serve as a channel for transferring technology to a host country. De Gregorio (1992) [4]argues that a positive role for FDI generates economic growth mainly in a particular environment. A positive effect on economic growth from the interaction between secondary school enrolment and imports of machinery was found by Romer (1993) [5]. Balasubramanyam, et al. (1996) [6] declares that trade openness is vital for obtaining the growth effects of FDI. Borensztein, et al. (1998) [7]argues that FDI has a positive growth effect when the country has a highly educated workforce that allows it to exploit FDI spillovers . Aneesa Rashid and Dua (1999) [8]attempts to identify the causality between FDI and growth in India.. Kishore Sharma (2000) [9]examines whether foreign direct investment had made any significant contribution to India's export growth.. Chakraborty and Basu (2002) [10] examined the causality between foreign direct investment and output growth (where GDP is used as a proxy for growth) in India. The causal nexus between foreign direct investment and economic growth in India for the years 1990 to 2002 was analysed by Sham Bhat, et al. (2004) [11]. The impact of capital flows on economic growth in India was examined by Mazumdar (2005) [12]. Using a panel data set for 27 transition economies over the period 1991 to 2004 the study by Nicholas et.al.,(2006) [13] confirms that FDI does exhibit a significant relationship with economic growth. Chakraborty and



Nunnenkamp (2008)[14] tried to examine the short-run and long-run causal nexus between foreign direct investment stocks in the primary, secondary and tertiary sectors in India for the years 1987 to 2000. Alkshasawneh (2013) [15] tries to examine the causality between FDI and economic growth in Qatar exhibits a positive relation between the both.

Despite FDI's potential to boost technology, productivity, investment and savings, economists have somewhat surprisingly struggled to find a strong causal link to economic growth. Economic growth also leads to foreign direct investment due to the fact that higher levels of economic growth will be attained through efficient use of resources, which reduces cost per unit of output, and creates market for the output produced. This will attract higher levels of Foreign Direct Investment. The above arguments create the phenomenon of economic growth and Foreign Direct Investment as complex in nature. The question of the causality between investment and growth is not a new one. Even Kuznets, who was a foremost proponent of the crucial role of investment in fixed capital, noted that there were cases where the acceleration in economic growth had preceded the rise in capital formation (Kuznets, 1973,p.129) [16] .If FDI has a positive impact on economic growth, then a host country should encourage FDI flows by offering tax incentives, infrastructure subsidies, import duty exemptions and other measures to attract FDI. If FDI has a negative impact on economic growth, then a host country should take precautionary measures to discourage and restrict such capital inflows.

Based on the above argument the current paper tries to find a causal nexus between FDI and economic growth in India. The rest of the paper is organized as follows:- Section 2 presents the methodology of the study. Empirical results and discussion are presented in Section 3. Finally, the concluding remarks are presented in Section 4.

II. METHODOLOGY

The causal nexus between FDI and economic growth, in India is analysed using Granger causality test (Grangers 1969) [17]. Granger causality test assumes that data series are stationary, to verify the stationary properties of FDI and GDP, the standard unit roots test like augmented Dickey-Fuller (ADF) test and Phillips-Perron (PP) test is used. Annual data for FDI and GDP (proxy for economic growth) from 1995 to 2013 is used to check the causality. The necessary information's were collected from World Investment Report 2013.

Granger Causality

The Granger (1969) test for causality between two variables is employed for this study. The test indicates that, for two time-series variables X_t , and Y_t , if X improves the prediction of Y, then X (Granger) causes Y. The estimating equations can be written simply as follows.

$$GDP_t = \sum_{i=1}^n \alpha_i GDP_{t-i} + \sum_{p=1}^n \beta_p FDI_{t-p} + \mu_t$$



$$FDI_t = \sum_{i=1}^n \lambda_i GDP_{t-i} + \sum_{p=1}^n \delta_p FDI_{t-p} + \eta_t$$

Where GDP_t and FDI_t are stationary time series, μ_t and η_t are white noise error term and i and j are the maximum lag length used in each time series. The optimum lag length is identified using Akaike information criterion (AIC) and Schwarz information (SC) criterion. Granger Causality test states that Y is not only influenced by lagged value of Y but also lagged values of X , then X causes Y . On the other hand if X is influenced by lagged values of Y in addition to lagged values of X then Y causes X . If X causes Y and Y also causes X then it is known as bi-directional relationship between X and Y . Further, if X doesn't cause Y and Y doesn't cause X then it is known as an independent relation between X and Y . A simple F-test can convey whether the lagged values of X contribute significantly to the explanatory power of Y equation.

The Dickey-Fuller test (1979, 1981) [18,19] is employed to examining the stationarity of the series, which requires the estimation of the following equation:-

$$\Delta X_t = B X_{t-1} \sum_{i=1}^n d_i \Delta X_{t-1} + e_t$$

where, n is large enough to make ' e_t ' a white noise. The null hypothesis that X_t is $I(0)$ is rejected in favour of an alternate hypothesis that X_t is $I(1)$, provided B is significantly negative. For testing purpose, t - statistics is taken as test 'statistic' though it does not follow the t - distribution (critical value are provided by Dickey and Fuller (1979, 1981)).

III. EMPIRICAL RESULTS AND DISCUSSIONS

The stationary properties of FDI and GDP is checked with the help of Augmented Dickey-Fuller (ADF) test. The optimum lag length for Augmented Dickey-Fuller test is automatically selected by using Akaike information criterion (AIC). Three alternative models are used to verify the stationary properties, they are: i) With Intercept; ii) with Intercept and time trend; and iii) Without Intercept and time trend.

Table 2 briefly reveals ADF test results for India. It is very clear from the table that the ADF test accepts the null hypothesis of a unit root in its level. When the ADF statistics are extended to the first differenced variables, it can be observed that the null hypothesis is rejected for FDI and is accepted for GDP (for few countries, while for few other countries the variables are stationary at first difference itself). Hence the ADF statistics is further extended to second differenced variables. And here, it can be observed that the null hypothesis is rejected for GDP. Hence, the selected variables, FDI and GDP are stationary at second difference.



The stationary properties of FDI and GDP is further checked using Philips-Perron test and the table 2 presents the results. Here, the optimum lag length is automatically selected on the basis of Newey West band using Bartlett Kernel. The results reported in this table show that FDI and GDP are stationary when estimated at first difference. Since, the variables are integrated in the same order and they are stationary at first difference, the next step is to check for Coiniegration. Since no Cointegration relation exists between the two variables, the Granger causality test can be applied in First or Second order (depending upon the values) to check the causal nexus between FDI and GDP in India.

Table 3 reveals the results of Granger causality test between Foreign Direct Investment and Gross Domestic product by using Annual data for the period 1995 to 2013 for India. The optimum lag length for granger causality was based on Akaike information criterion (AIC) and Schwartz Bayesian criterion (SBC), where $AIC = T \ln(\text{residual sum of squares}) + 2n$ and $SBC = T \ln(\text{residual sum of squares}) + n \ln(T)$. The AIC and SBC are model selection criteria developed for maximum likelihood estimation techniques. In minimizing the AIC and SBC, the natural logarithm of the residual sum of squares adjusted for sample size, T, and the number of parameters included, n are minimized. The computed F value is significant from 2 lags onwards i.e., the causation runs from GDP to FDI. Hence, it can be concluded that Economic growth leads to more Foreign Direct Investment inflow in **India** which is supported by many literature. {Chakraborty and Basu (2002) [10], Wang (2002) [20], Basu *et al.* (2003) [21], Jong I Choe (2003) [22], Nonnemberg and Mendonça (2004) [23]}.

IV. CONCLUSION

In India the increasing market size attracts more foreign direct investment, resulting from the expected higher level of profitability. As a result, greater the domestic market size, the greater the flows of foreign direct investment, larger flows of foreign direct investment into India brings productivity gains, technology transfer, introduction of new processes, managerial skills and know-how to the domestic market, with international production networks and access to markets that contributes to economic growth through spillover effect, linkage effect and competition effect. Further, this flow promotes the size of the domestic market that leads to rapid economic growth, resulting from the higher level of aggregate demand.



Table-1 Trends in FDI Inflow
(In \$ Us Million)

Year/Economy	1970	1980	1990	2000	2010	2013
World	13345.59	54086.728	208092.46	1409011.9	1351681.6	1383998.2
Developing Economy	3854.46 (28.88)	7510.47 (13.88)	35018.3 (16.83)	266644 (18.92)	648208 (47.96)	798372 (57.69)
Developed Economy	9491.24 (71.12)	46575.8 (86.11)	173074 (83.17)	1142368 (81.08)	703474 (52.04)	585626 (42.31)
India**	45.46 (1.18)	79.16 (1.06)	236.69 (0.68)	3597.66 (1.34)	21125.45 (3.26)	28542.84 (3.58)

Source: UNCTAD, World Investment Report 2013

(Figures within parenthesis indicate the percentage to the World)

** for India the figures within parenthesis indicates the percentage to the Developing Economy.

Table 2: Unit Root Test Statistics for FDI and GDP, (t- values)

(I) Augmented Dickey-Fuller Test Results						
	At logarithmic levels		First Difference		Second Difference	
	FDI	GDP	FDI	GDP	FDI	GDP
With Intercept	-0.94 (0.75)	0.70 (0.99)	-3.78 (0.01)*	-2.80 (0.08)**	-5.68 (0.00)*	-5.73 (0.00)
With Intercept & Time Trend	-2.0 (0.56)	-2.78 (0.22)	-3.63 (0.06)**	-2.67 (0.26)	-5.44 (0.00)*	-5.57 (0.00)*



Without Intercept and Time Trend	1.31 (0.94)	5.08 (1.0)	-3.50 (0.00)*	-0.12 (0.62)	-5.90 (0.00)*	-5.91 (0.00)*
(II) Philips-Perron Test Results						
	At logarithmic levels		First Difference		Second Difference	
	FDI	GDP	FDI	GDP	FDI	GDP
With Intercept	-0.94 (0.75)	0.68 (0.99)	-3.78 (0.01)*	-2.82 (0.08)**	-9.82 (0.00)*	-5.63 (0.00)*
With Intercept & Time Trend	-2.0 (0.55)	-1.87 (0.62)	-3.63 (0.06)**	-2.67 (0.26)	-10.99 (0.00)*	-6.08 (0.00)*
Without Intercept and Time Trend	1.41 (0.95)	5.08 (0.99)	-3.50 (0.00)*	-1.66 (0.09)**	-10.25 (0.00)*	-5.91 (0.00)*

t- value is provided for ADF test and adjusted t- value is provided for Philips-Perron test
p- value is provided within parenthesis .*,** significant at 1% and 5% levels.

Table: 3 Granger-Causality test Results between Foreign Direct Investment and Gross Domestic Product.(F- value)

Lag Length	FDI does not Granger Cause GDP	GDP does not Granger Cause FDI	Inference
2 lag	0.96	6.35*	GDP->FDI
3 lags	0.34	5.05*	GDP->FDI
4 lags	0.52	4.73*	GDP->FDI
5 lags	0.31	4.13**	GDP->FDI

*,** significant at 1% and 5% levels



Abbreviations and Acronyms

FDI: Foreign Direct Investment
UNCTAD: United Nations Conference on Trade and Development
AIC: Akaike information criterion
SBC: Schwartz Bayesian criterion
ADF: Augmented Dickey-Fuller
PP: Phillips-Perron test

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