CAUSALITY BETWEEN FOREIGN DIRECT INVESTMENT AND ECONOMIC DEVELOPMENT AN INDIAN CASE STUDY

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Abstract: Economic development remains an urgent global need. Although many countries have achieved significant increases in income in the last few years, there still exist great international inequalities in the level of income. The lower class of nations is still far bigger. It is to raise the standard of living of the people in such countries and to enable them to use the fruits of scientific and technological miraculous advances in agriculture, industry, transport, communication, education, health services and other fields, it is almost essential that in such economies, capital formation should take place at a higher rate than before, so that the big developmental projects may be financed properly. Thus, for rapid economic development, the central problem is capital formation. In a world of intensifying competition and accelerating technological change, the complementary and catalytic role of foreign capital is very valuable. The present paper analyses the effect of FDI, manufacturing and gross fixed capital formation on economic growth in India for the period 1978- 2016. The paper attempts to use the Johansen maximum likelihood co-integration test to determine long-run relationships among the variables being investigated. For examining the causality, the Granger causality analysis is also performed. The results show that there is uni directional causality and long run relationship from FDI to GDP and from manufacturing to GDP in case of India during the period under study. In addition to this, GDP does not granger cause with gross domestic capital formation.

Keywords: Foreign Direct Investment, Economic Development, India, Co-integration, Causality.

Introduction: Promoting the development and welfare of the people of the country is the primary concern of all the policy makers around the globe. During the last two decades and a half, Foreign Direct Investment is recognised as an important tool for the growth and development of the nations. Countries have been actively seeking FDI over the years , in view of the favourable effects of FDI on income generation, advanced technology, employment generation and managerial skills. FDI inflows amounted to US $ 1762 billion in the world in 2015, having risen from US $ 207 billion in 1990. Developed countries have been the recipient of 55% of FDI inflows in 2015, reversing a downturn, subsequent to the recession of 2008. United States, remained the largest FDI recipient in the world, with inflows of US $ 380 billion. China, including Hong Kong, occupies the second place in the list of top ten recipients of FDI in the world with FDI inflows of US $ 311 billion in 2015. India has been the fourth largest recipient in Asia and tenth largest recipient of FDI in the world in 2015 with FDI inflows amounting to US $ 44.21billion. More and more new policy measures continue to be geared towards FDI liberalisation and promotion by all countries around the globe.

Traditionally, policies towards promotion of FDI focused mainly on maximising inward investment flows. FDI was primarily viewed as a stable source of financing in the balance of payments. The quantitative approach looked at FDI as a tool to capital accumulation and employment generation. However, with globalisation and advancement in information technology and communication , there is free flow of factors of production over the globe. This process is favourable to all the stakeholders , since there can be efficient utilisation of capital, technology and labour. The present study attempts to examine if FDI inflows have contributed to the economic development of India over the years or not.

India has been following the policy of liberalisation toward FDI since 1991. FDI is permissible in almost all sectors except a few. In total US $ 424 billion have flown in India as FDI since 2001. Service sector is the largest recipient of FDI in India. In 2015-16 itself, service sector received US $ 6.9 billion. The computer hardware and software sector is the next biggest recipient of FDI and received US $ 2.12 billion in 2015-16. India host largest FDI inflows from Singapore, Mauritius, USA, Netherland and Japan. Huge investment projects have been announced by the government , from MNC's like Honeywell International Corporation (USA), PanasonicCorporation (Japan), Vistara Group Limited (Hong Kong), Banana Republic (USA), Apple(USA), Coolpad Group Limited (China) and Thyssenkrupp Group (Germany). The government has proposed many reforms in the FDI policy in the area of insurance and pension , asset reconstruction companies and stock exchanges, like easier fund raising norms and their governance , clarification of tax related matters and higher FDI limits. Also in the pipeline is the residency permit policy which will allow key executives of foreign companies investing US $ 2 billion or more in India , to many facilities like special package on upscale housing, residency permits allowing long stay in the country, and cheap rates for utilities . India is likely to grant most favoured nation treatment to 15 countries and this will result in easing of investment rules for these countries. The government plans to simplify rules for FDI further by increasing FDI limits in various sectors and including more sectors in the automatic approval route to attract more FDI in the country.

Theoretical Exposition: Economic growth is one of the important indices for all the countries in the world. Economic growth of a country implies increase in social welfare of its people and increase in its development in the long period. Therefore, all the countries make special plans and policies to boost the economic growth . Economically speaking , many variables impact economic growth, for example, technology, physical capital , human capital , trade liberalisation , exchange rates & so on. Foreign capital is one of the variables which impact the economic growth of a country.

Economic growth of a country is impacted by foreign capital directly and indirectly. Foreign capital leads to increase in production , employment , value addition and exports which result in increase in GDP directly . At the same time, foreign capital increases GDP indirectly through transfer of technology knowledge and know - how, externalities, human capital formation and efficiency and productivity. Since foreign capital brings with it latest technology, with improved technology , domestically, the high quality products with lower cost will be supplied resulting in increase in national production and per capita output.

There are many theories which show that FDI results in economic growth through transfer of technology , spillover of technology and enhancement of productivity. There are other theories too, which take the opposite view. They apprehend that foreign capital decreases economic growth of a country through negative resource allocation in trade and finance. However, this may be due to poor infrastructure, inefficient human resource, and obsolete technology and so on which fail to attract latest technology & know how.

Empirical Literature: Gnangnon,Sena Kimm and Roberts,Michael (2015) ,This paper empirically examines whether the Aid for trade programmes and Foreign Direct Investment inflows affect export upgrading and whether these effects are complementary or substitutable. Export upgradation has been defined as export diversification and export quality improvement. Export diversification can be reflected in increase in the volume of active existing product lines and increase in the export of new product lines or export of new destinations or new trading partners. Export quality improvement has been associated with an improvement in the quality of existing products. The empirical analysis is conducted on a panel dataset of 86 recipient countries over the period of 1995-2010, with the focus on 23 least developed countries. Based on the system GMM approach, the results show that the total aid for trade flows have a strong impact on export upgrading. The least developed countries appear to obtain the most benefit on the diversification of their exports by increasing the volume of exports and also by improving the quality of exports. Secondly, the FDI inflows also exert a positive on export diversification in the host countries, and they also influence the quality of exports positively and strongly in the recipient countries, more importantly , the least developed countries. The study also shows that the aid for trade

flows and the FDI inflows are substitutes in achieving the export diversification in the host countries , but complementary in their effect on improving the export quality in these countries. The paper also shows that the degree of substitutability is lower in case of LDCs, which require both the AfT flows and FDI inflows to achieve higher export products quality. The degree of complematarity effect is higher in case of LDCs as compared to Non- LDCs.

Blin, Myriam and Quattara, Bazoumana(2009)- This paper analyses the FDI - growth relationship in the context of Mauritius during the 1975-2000 period. The methodology used in this paper is based on the ARDL bounds cointegeration approach proposed by Pearson. The results show that the variables used in the production function are bound together in the long run. The long run estimates show that foreign direct investment and domestic private investment are most growth enhancing investments in Mauritius. The human capital was also found to play an important role in promoting economic growth . The financial sector development and openness did not appear to have a significant impact on growth in the context of Mauritius.

Melnyk, Loenld , Kubatco, Oleksandr and Pysarenko, Serhly(2014)- This study investigates the impact of foreign direct investment on economic development of post Comecon transition economy countries. The Neoclassical growth theory model is used to analyse the effects of FDI on economic growth. The results show significant FDI influence on economic growth of host countries. The study has used a basic augmented production function with FDI as one of the explanatory variables and gross domestic product in real terms as the dependent variable. Other explanatory variables are the exogenous state of technology, the physical capital, the labour input, the foreign capital and ancillary variables including policy and infrastructure variables like enterprise restructuring, price liberalisation, trade and foreign exchange system and competition policy. The data on macroeconomic variables is obtained from the European Bank of Reconstruction and Development and the data on human capital is obtained from the NationMaster data portal. The panel data on 26 countries in the transition over a period of 13 years has been used. To determine the appropriate method of panel data estimation, the Hauseman specification test has been used . The test shows that it was appropriate to use the fixed effect, rather than the random effect. The results show that the influence of FDI is positive and significant at 1% level of significance. The impact of trade policy is also positive and significant at 10% level of significance. However, the problem of endogeneity has not been addressed due to lack of appropriate instrumental variables. Overall, FDI is found to be positively correlated to the GDP growth in Comecon countries.

Agarwal, Gaurav(2015). This paper examines the relationship between FDI and economic growth in Bricks countries between 1989-2012. As there is bi- directional relationship between FDI inflows and the economic growth rate, this study investigates the causal relationship between FDI and economic growth both at individual level using pair- wise granger causality analysis and at panel level using VEC granger causality/ Block Exogeneity Wald Test. The Pedroni's panel cointegration test shows that FDI economic growth are integrated in the long run at the panel level and the Granger Causality Test test at the panel level level confirms the presence of bidirectional causality between FDI - economic growth. Thus the study concludes that the increase in the level of FDI helps in inducing economic growth and development & vice- versa. The efforts should be made to encourage other potential sources of economic development to stimulate and enhance foreign investments.

Aga A. A. Khder(2014) .This paper analyses the effect of FDI on economic growth in Turkey for the period 1980- 2012. The OLS and Vector Autoregression model is employed to estimate the causal linkage between FDI and economic growth . The results show that there is no causality and long run relationship between GDPk and FDI in case of Turkey. In addition to this, GDP does not granger cause with domestic investment and trade libealisation Granger causes with GDP. In the short run, by using OLS regression, the results show that there is short run and positive relationship between GDP and FDI. Also, there is negative short - term relationship between domestic investment and GDP.

Emmamuel, Ongo NKOA B. (2014).- This paper examines the impact of FDI on economic growth in CEMAC countries (Camroon, Congo, Gabon, Equatorial Guinea, CAR, Chad). This paper adopts the

theoretical and conceptual model of Mankin, Romer and Weil where production is the function of physical capital, human capital , technical progress and labour. It includes FDI , infrastructure, and openness also into the production function. The descriptive statistics shows that variables are more stable in Cameroon, CAR & Chad and volatile in Equatorial Guinea, Congo and Gabon. The correlation matrix shows strong correlationship between growth and all explanatory variables except human capital. The unit root test shows that all variables are stationery at 1% and 5% and they maintain a long term relationship and are integrated at zero. The regression analysis shows the positive significance of FDI on economic growth in CEMAC zone . The coefficient is not significant in case of infrastructure and openness. FDI contributes positively and significantly, both to economic growth across the sub region as well as in individual member states.

Methodology: The present paper attempts to analyze the FDI led growth hypothesis in three steps:

1. Test the stationarity properties of the time series
2. Test for cointegration
3. Test for direction of causality.

Unit Root Test: A time series Y_t (t=1,2...) is said to be stationary if its statistical properties do not vary with time .Stationarity tests allow verifying whether a series is stationary or not. There are two different approaches: 1) stationarity tests such as the KPSS test that consider as null hypothesis Ho that the series is stationary, and 2) unit root tests, such as the Dickey-Fuller test and its augmented version, the augmented Dickey-Fuller test (ADF), or the Phillips-Perron test (PP), for which the null hypothesis is on the contrary that the series possesses a unit root and hence is not stationary. To study the stationarity properties of time series, the Augmented Dickey–Fuller test (ADF) is conducted in this paper. The test involves estimating the regression

$$\Delta Xt=\alpha+\rho t+\beta Xt-1+\sum i=1k-1\gamma i\Delta Xt-i+\varepsilon t \quad (1)$$

In the above equation, α is the constant and ρ is the coefficient of time trend. X is the variable under consideration. In our case, the variables include log(FDI), log(MANUFAC), log(GFCF), and log(GDP). Δ is the first-difference operator; t is a time trend; and ε is a stationary random error. The test for a unit root is conducted on the coefficient of Xt-1 in the above regression. If the coefficient, β, is found to be significantly different from zero (β≠0), the null hypothesis that the variable X contains a unit root problem is rejected, implying that the variable does not have a unit root.

Cointegration Analysis: Cointegration is a statistical property of time series variables. Two or more time series are said to be cointegrated if they share a common stochastic drift. If two or more series are individually integrated but but some linear combination of them has a lower order of integration , then the series are said to be cointegrated, for instance, say where the individual series are first order integrated but some cointegrating vector of coefficients exists to form a stationary linear combination of them . For example, a stock market index and the price of its associated futures contract move through time, each following a random walk. Testing the hypothesis that there is a statistically significant connection between the future price and spot price can be done by testing for the existence of a cointegrated combination of the two series.

The present paper attempts to use the Johansen maximum likellihood cointegration test to determine long-run relationships among the variables being investigated. In examining causality, the Granger causality analysis is also performed. In order to obtain good results from the test, selecting the optimal lag length is so important. The Johansen cointegration framework takes its starting point in the vector autoregressive (VAR) model of order p given by:

$$yto=A1yt-1+...+Apyt-p+Bxt+\varepsilon t, \quad (2)$$

where yt is a vector of endogenous variables and A represents the autoregressive matrices. xt is the deterministic vector and B represents the parameter matrices. εt is a vector of innovations and p is the lag length. The VAR can be re-written as:

$\Delta yt=\Pi yt-1+\sum i=1p-1\Gamma i\Delta yt-i+Bxt+\varepsilon t,$ (3)
where $\Pi=\sum i=1pAi-I$ and $\Gamma i=-\sum j=i+1pAj$

The matrix Π contains the information regarding the long-run coefficients of the yt variables in the vector. If all the endogenous variables in yt are cointegrated at order one, the cointegrating rank, r, is given by the rank of $\Pi=\alpha\beta$ where the elements of α are known as the corresponding adjustment of coefficient in the VEC model and β represents the matrix of parameters of the cointegrating vector. To indicate the number of cointegrating rank, two likelihood ratio (LR) test statistics, namely the trace and the maximum Eigen value tests are used to determine the number of cointegrating vectors. The two tests are defined as: $\lambda trace=-T\sum i=r+1klog(1-\lambda i)$ and $\lambda max=-Tlog(1-\lambda i+1)$, where λi denotes the estimated values of the characteristic roots obtained from the estimated Π, and T is the number of observations. The first statistic test tests Ho that the number of cointegrating vector is less than or equal to r against the alternative hypothesis of k cointegrating relations, where k is the number of endogenous variables, for r = 0, 1, … , k–1. The alternative of k cointegrating relations corresponds to the case where none of the series has a unit root. The second test tests the null that the number of cointegrating vectors is r, against the alternative hypothesis of 1 + r cointegrating vectors.

Granger Causality Test: In order to identify the long-run relationship among the series under study, the Johansen co-integration test must be done. However, the test does not indicate anything about the direction of causality among the variables in the system; therefore, the Granger causality analysis must be done. If the series are co-integrated, the VECM-based Granger causality analysis is an appropriate technique used to determine the long-run and the short-run relationships based on the following forms:

1: Y = [log(GDP), log(FDI)]
$\Delta log(GDP)t=\beta 1,t+\sum j=1n-1\beta 11,j\Delta log(GDP)t-j+\sum j=1n-1\beta 12,j\Delta log(FDI)t-j+\delta 1ECt-1+\mu 1t$ (4)
$\Delta log(FDI)t=\beta 2,t+\sum j=1n-1\beta 21,j\Delta log(FDI)t-j+\sum j=1n-1\beta 22,j\Delta log(GDP)t-j+\delta 2ECt-1+\mu 2t$ (5)

2: Y = [log(GDP), log(MANUFAC)].....
$\Delta log(GDP)t=\gamma 1,t+\sum j=1n-1\gamma 11,j\Delta log(GDP)t-j+\sum j=1n-1\gamma 12,j\Delta log(MANUFAC)t-j+\theta 1ECt-1+\varepsilon 1t$ (6)
$\Delta log(MANUFAC)t=\gamma 2,t+\sum j=1n-1\gamma 21,j\Delta log(MANUFAC)t-j+\sum j=1n-1\gamma 22,j\Delta log(GDP)t-j+\theta 2ECt-1+\varepsilon 2t$ (7)

3: Y = [log(GDP), log(GFCF)]
$\Delta log(GDP)t=\rho 1,t+\sum j=1n-1\rho 11,j\Delta log(GDP)t-j+\sum j=1n-1\rho 12,j\Delta log(GFCF)t-j+\phi 1ECt-1+\eta 1t$ (8)
$\Delta log(GFCF)t=\rho 2,t+\sum j=1n-1\delta 21,j\Delta log(GFCF)t-j+\sum j=1n-1\rho 22,j\Delta log(GDP)t-j+\phi 2ECt-1+\eta 2t$ (9)

log(GDP), log(FDI), log(MANUFAC), and log(GFCF) denote the natural logarithms of real GDP per capita, FDI, manufacturing, and investment, respectively. The coefficients of the ECt–1 term indicate causality in the long run and the joint F test of the coefficients of the first-differenced independent variables confirms short-run causality. Δ denotes first-difference operator. μ1t and μ2t are the stationary disturbance terms for Equations (4) and (5), respectively. n is the order of the VAR, which is translated into lag of n–1 in the error correction mechanism. δ1 and δ2 denote the coefficients of long-run Granger causality for Equations (5) and (6), respectively. In Equation (4), the coefficients of lagged value β12, j for j = 1, … n–1 represent short-run effects of FDI stock on GDP. In Equation (5), the coefficients of lagged value β22, j for j = 1, … n–1 represent short-run effects of GDP on FDI. In Model 2, θ1 and θ2 denote the coefficients of long-run Granger causality for Equations (6) and (7), respectively. In Equation (6), the coefficients of lagged value γ12, j for j = 1, … n–1 represent short-run effects of manufacturing on GDP. In Equation (7), the coefficients of lagged value γ 22, j for j = 1, … n–1 represent short-run effects of GDP on manufacturing. ϕ1 and ϕ2 denote the coefficients of long-run Granger causality for Equations (8) and (9). In Equation (8), the coefficients of lagged value ρ12, j for j = 1, … n–1 represent short-run effects of investment on GDP. In Equation (9), the coefficients of lagged value ρ22, j for j = 1, … n–1 represent short-run effects of GDP on investment.

Data Analysis: The present study includes foreign direct investment as well as gross fixed capital formation and manufacturing output as the main drivers of economic growth. Economic growth is

represented by the real GDP per capita. Foreign direct investment is measured by foreign direct investment inflows as a percentage of GDP. Manufacturing is measured by the manufacturing output as a percentage of GDP . Gross fixed capital formation is measured as a percentage of GDP again. The period covered under study is 1978 to 2016.The data source is World Development Indicators Database by the World Bank.

Table 1 represents the test of the stationarity on the data series. The stationarity check is an important requirement to avoid the spurious results of policy analysis. The table shows that all Log GDP, Log FDI , Log GFCF and Log MANUFAC have unit roots . The null hypothesis of non stationarity of all the variables can be rejected. But the differenced series at the first level is found to be stationary as the null hypothesis of the non stationarity of the series is rejected at 5% level of significance. This means that the variables are integrated of order 1. I (1).

Having confirmed the existence of unit roots for the data series under study, in the next step it is important to check the possibility of existence of long run relationship between foreign direct investment , gross fixed capital formation , manufacturing and economic growth. Table II,III& IV show the results of Johansen ' Co-integration Test . Thee bivariate Johansen Co-integration test indicates the values of trace statistic and eigenvalue are greater than critical values at 5 % level of significance in case of Log FDI and Log GDP , and also in case of Log MANUFAC and Log GDP but lower than critical values at 5 % level of significance in case of Log GFCF and Log GDP. This result suggests that there exists long run relationship between FDI and GDP and manufacturing and GDP , but this relationship does not exist between gross fixed capital formation and GDP in India during the period 1978 to 2016.

The Johansen Co-integration test does not tell about the direction of causality between the observed variables. The Granger causality test can be applied to study the causal impact of FDI , as well as manufacturing on the economic growth of India during the period under study. In Table V the results show unidirectional causality from FDI to GDP and from GDP to manufacturing at 5 % level of significance.

Conclusion and Policy Implications: The present study suggests that the economic growth of India is impacted by foreign direct investment and manufacturing output in the long run. However GDP growth itself is not found to attract more foreign direct investment in India. This indicates that the policy makers have to make more foreign investors friendly policies to attract more FDI. Also , there is need to improve macro economic policies , develop physical infra structure , focus on financial sector development, and provide encouraging set up for trade and investment. So that more and more FDI can flow into India. There is a strong need to push manufacturing sector also , by providing financial cushion and an enabling environment. Tax incentives would be called for make taxation reforms.

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Table I- Augmented Dickey Fuller Test

Series	Level	First Difference
Log(GDP)	0.703	,-5.582*
Log(FDI)	,-1.555	,-5.583*
Log(GFCF)	,-1.915	,-5.584*
Log MANUFAC)	,-1.5700	,-5.585*

* Rejection of Null Hypothesis at 1% Level of Significance

Table II- Johansen's Cointegration Test

1. Y= [log (GDP), log(FDI)]			
Hypothesised No. Of CEs	Trace Statistics	5% Critical Value	prob
0	19.74	18.17	0.03
1	1.27	3.84	0.25
Hypothesised No. Of CEs	Max-Eigen Statistics	5% Critical Value	prob
0	18.47	17.14	0.03
1	1.27	3.84	0.25
2. Y= [log (GDP), log(GFCF)]			
Hypothesised No. Of CEs	Trace Statistics	5% Critical Value	prob
0	4.98	18.17	0.93
1	0.1	3.74	0.74
Hypothesised No. Of CEs	Max-Eigen Statistics	5% Critical Value	prob
0	4.87	16.87	0.91
1	0.1	3.74	0.74
2. Y= [log (GDP), log(MANUFAC)]			
Hypothesised No. Of CEs	Trace Statistics	5% Critical Value	prob
0	18.94	18.17	0.04
1	1.03	3.74	0.31
Hypothesised No. Of CEs	Max-Eigen Statistics	5% Critical Value	prob
0	17.91	16.87	0.03
1	1.03	3.74	0.31

Table III -Granger Causality Test

Null Hypothesis	F Statistics	prob
Log GDP does not Granger Cause log FDI	0.89	0.35
Log FDI does not Granger Cause log GDP	3.82	0.05
Log GDP does not Granger Cause log GFCF	1.03	0.31
Log GFCF does not Granger Cause log GDP	0.55	0.46
Log GDP does not Granger Cause log MANUFAC	7.42	0.01
Log MANUFAC does not Granger Cause log GDP	0.33	0.56

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