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INFLUENCE OF GDP GROWTH RATE ON FDI INFLOWS IN THE POST-LIBERALIZED INDIAN ECONOMY

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Abstract

Empirical studies uphold GDP growth rate as one of the determinant factors of FDI inflows. United Nations Conference on Trade and Development (UNCTAD) in its World Investment Report 2002 and 2012 identified Real GDP growth and GDP per capita of the host country as crucial factors that attract inward FDI. It is evident that the developed economies having high GDP figures receive the major part of world FDI flows. It is also observed that the countries where the growth rate is comparatively high enjoy good flows of inward FDI.

India experienced a smart growth of GDP during the post-liberalized period but the growth has not found any consistency so far. The present study is intended to find whether the sluggish growth trend of Indian economy in the present decade influences the country's inward FDI flows negatively or not. The study finally finds that the GDP growth rate alone fails to determine the FDI inflows in India in the post-liberalized period.

Keywords: *GDP growth rate, FDI inflows, Liberalized India, FDI determinants.*

JEL classification: *E60, F21, H20, O40.*

Introduction

There are empirical evidences that Foreign Direct Investment (FDI) plays a pivotal role in the economic growth of the host country. FDI generates new employment, enhances human resource, builds infrastructure and create business environment in the recipient country. It increases foreign exchange reserve and decreases current account deficit of

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the host economy. Hence, all the developing economies welcome FDI and offer different business advantages to the foreign investors. Liberalized India adopted a number of policies to attract FDI and the country has experienced a smart growth of inward FDI during the last two decades.

There is a vast literature that identified a great number of determinants which influence FDI flows. Greatly cited literature by John H Dunning explained 'Eclectic paradigm' that is a combination of three sub-paradigms namely Ownership Advantages (O), Location Advantages (L), and Internalization advantages (I), as a guide for MNE's investment decision (Dunning, 1988; 2000)[1,2]. Apart from that, a number of empirical literature find different economic and non-economic variables that determine the FDI flows between the countries.

In *World Investment Report 2002*, UNCTAD compares the performance and potential of countries in attracting FDI inflows. To formulate inward FDI Potential Index, it selected eight determinant variables and the Index is an average of the scores on eight variables for each country (UNCTAD, 2002)[3]. The variables are:-GDP per capita, Real GDP growth (for the past 10 years), Exports as a percentage of GDP, Number of telephone lines per 1,000 inhabitants, Commercial energy use per capita, R&D expenditures as a percentage of gross national income, Students in tertiary education as a percentage of total population, and Country risk.

Earlier in *World Investment Report 1998*, UNCTAD defined the determinants under four major heads:- A. The national FDI policy framework; B. Business facilitation; C. Economic determinants; and D. The impact of international policy frameworks. In the Economic Determinants UNCTAD upheld natural resources, host country market size, and the availability of low cost skilled and unskilled labour as the important determinants of FDI. But the Inward FDI 'Potential Index' of *World Investment Report 2012* 'captures four key economic determinants of the attractiveness of an economy for foreign direct investors. They are the attractiveness of the market, the availability of low-cost labour and skills, the presence of natural resources, and the presence of FDI-enabling infrastructure' (UNCTAD, 2012)[4]. Here the head 'Market attractiveness' is defined as under -

- Size of the market (GDP)
- Spending power (per capita GDP)
- Growth potential of the market (real GDP growth rate)

Hence, it is rational to consider that GDP numbers, per capita GDP, and Real GDP growth rate as the important determinants of FDI inflows in India. India experienced a smart growth of GDP during the post-liberalized period but the growth has not found

any consistency so far. But, on the other hand FDI inflows remain consistently high in the atmosphere of recent sluggish growth trend.

Review of Literature

In the empirical literature different determinant factors of FDI is found by different researchers. Dunning (1988)[1] introduced eclectic paradigm or OLI paradigm which identified a number of factors own by the MNEs or host countries. David W. Loree and Stephen E. Guisinger (1995)[5], in their paper *'Policy and Non-policy Determinants of U.S. Equity Foreign Direct Investment'*, examined the impact of policy and non-policy determinants on United States' FDI outflows to different economies. The authors concluded that both types of determinants were important but policy variables were more important as the government can change them easily as they require, but non-policy variables such as market size, take more time to be changed. Ismail Cevis and Burak Camurdan (2007)[6], in their paper '*The Economic Determinants of Foreign Direct Investment in Developing Countries and Transition Economies'*, found that the economic resources of the host countries play an important role in FDI inflows. They also found that the determinants of FDI in the cases of transition economies are the inflation rate, the interest rate, the growth rate and the trade (openness) rate.Khondoker Abdul Mottaleb and Kaliappa Kalirajan (2010)[7], in their study on *'Determinants of Foreign Direct Investment in Developing Countries: A Comparative Analysis'*, examined the reason behind the unequal distribution of FDI inflows in the developing economies. The authors found that the developing countries with high GDP and high growth rate having good business environments can attract a modest amount of FDI.

UNCTAD (1998)[8], in its *World Investment Report 1998*, released data on FDI inflows and outflows worldwide. The report showed a remarkable growth of FDI inflows to the developing counties in 1997. The report stated three host country determinants of FDI - 1) Poly framework for FDI, 2) Economic determinants, and 3) Business facilitation. It also advocates for Bilateral Investment Treaties under the International policy framework. Vani Archana (2010)[9], in her book *'Foreign Direct Investment in India – An In-depth Analysis'*attempted to examine the influences of the different determinants of industry level FDI along with their individual-specific differences. The study covered the post-reforms period from 1991 to 2000 for the industry as well as state level analysis. Anitha. R (2012)[10], in her paper *Foreign Direct Investment and Economic Growth in India* identified Gross Domestic Product (GDP) as one of the important determinant of FDI inflows in India. Again, in their discussion paper *Does Growth Attract FDI?* Sasi Iamsiraroj and Hristos Doucouliagos (2015)[11]showed that there was a robust positive correlation between growth and FDI, especially in the cases of developing countries.

On the other hand, in his book *'Foreign Direct Investment in India – Problems and*

Prospects', Rais Ahmad (2008)[12] identified that one of the main problems faced by the foreign investors in India was the bureaucratic control in the approval of FDI proposals and regulations. After considering the benefits of inward FDI, the author marked the unsatisfactory performance of India in receiving FDI flows. In his book he finally suggested that the government should go for a further liberalized policy for direct investments. Amitabh Kant (2015)[13], in his article *'Transferring India into a Global Manufacturing Hub'* published in the Yojana (March-2015), advocated for 'Make in India'. From the backdrop of slow growth and lower FDI inflow, the government emphasized on major policy change to get foreign investment attracted to India. The author mentioned that Simplification of tax system, skill development of potential workforce, fast and hazardless process of establishing business in India were some of the initiatives taken by the government for making 'Make in India' successful.

Research Gap

Many economic factors that have impact on FDI flows between countries are found in the empirical literature. Impact of GDP or GDP growth on the inward FDI in India is also examined in different studies. But few studies are there that have tried to find the influence of Indian GDP growth rate on FDI inflows in the country.

Objective of the Study

The study is intended to find the impact of GDP Growth Rate on the Inward FDI in the context of post-liberalized India. Hence, the objective of this study is to examine the influence of India's GDP Growth Rate on the FDI inflows to the country in the period selected for the study.

Period of the Study

The study examines the role of GDP Growth Rate in the FDI inflows in the post-liberalized India. Therefore, the period of the study is limited to 27 years starting from the year 1991 to the current year or 2016 (because at present the data are available up to the year 2016).

Methodology

Sources of Information: The study is based on the secondary data available in the websites of governments and reputed national and international organizations. Statistical data used for the study have been collected from the websites of World Bank, International Monetary Fund, UNCTAD, and OECD.

Variables: The study is based on the analysis of two variables GDP Growth Rate of India and FDI Inflows in India. Here the Dependent variable is FDI Inflows in India (named as FDI in the analysis) and the explanatory variable is GDP Growth Rate of India (named as GDPG in

the analysis).

Tools: Raw data is tabulated as per tabulation plan and processed in Microsoft Office Excel. The time series data are transformed into natural log values for the study. Processed data is analyzed by using proper statistical tools. 'Eviews' and 'XLStat' are the software that have been used for this purpose.

Empirical analysis: The study is intended to find out whether GDP Growth Rate of India can influence the FDI inflows in India. Hence, it becomes necessary to examine the relationship between the dependent variable (Y), i.e. FDI inflows in India, and the GDP Growth Rate of India that is the explanatory variables (X) in this study. As the variables are found to be cointegrated, time series Vector Error Correction Model (VECM) has been used for measuring both short-run and long-run relationships between Y and X. The impact of X on Y is also measured by Impulse Response Function Test and Variance Decomposition of VAR. Johansen Cointegration Test Model is used to examine the cointegration in the time series. For checking the Stationarity of time series, Augmented Dickey-Fuller Test is performed. The appropriateness of the selected model is assured through Residual Diagnostics tests.

Hypothesis: H_{01}: There is no long run causality running from 'GDP Growth Rate of India' (GDPG) to 'FDI inflows in India' (FDI).

H_{02}: There is no short run causality running from 'GDP Growth Rate of India' (GDPG) to 'FDI inflows in India' (FDI).

Empirical Analysis & Results

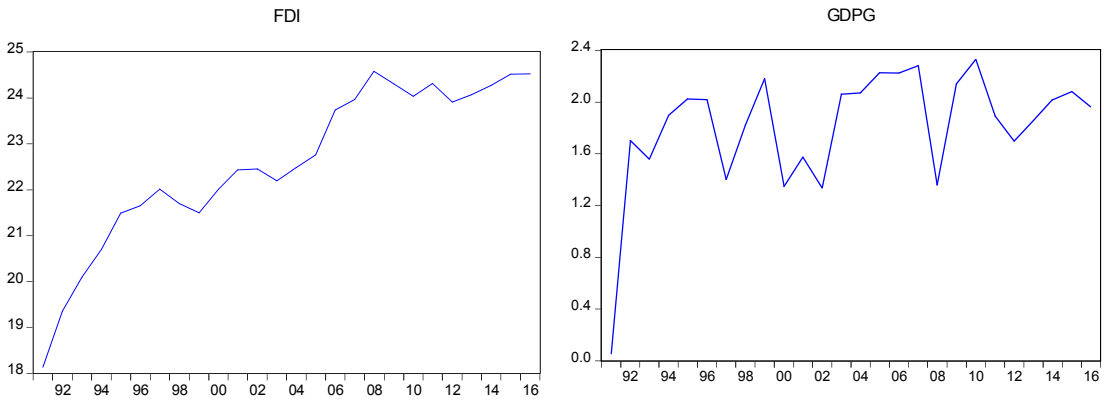


Fig. 1: Plots of the Variables
Source: World Bank & UNCTAD

Unit Root Test

Analysis of time series requires stationary data. If a series is non-stationary, it can influence its behaviour and property. Therefore, the series selected for the study have undergone a unit

root test. In other words, for checking whether the series are stationary or not Augmented Dickey-Fuller test is performed here.

Null Hypothesis: The series has a unit root.

Table 1: Augmented Dickey-Fuller (ADF) Test

Variables	Level	T- Statistic	p-value*	Decision
FDI	At Level	- 3.630429	0.0124	**H_0 is rejected**
GDPG	At Level	- 6.703891	0.0000	**H_0 is rejected**

Source: Computed by author

Results : The ADF test suggests that the null hypotheses in the cases of both of the series are rejected at 5% significant level. Therefore the variables FDI inflows (FDI) and GDP Growth Rate (GDPG) are Stationary at level and do not require differencing for any statistical analysis.

Lag Order Selection

For running Cointegration model and VAR or VECM, the optimum lag length of the pair of variables needs to be defined. Unrestricted VAR is run to find the lag length for this pair through VAR Lag Order Selection Criteria.

Table 2 : VAR Lag Selection Criteria

Lag	Log L	LR	FPE	AIC	SC	HQ
0	-41.99475	NA	0.157235	3.825631	3.924369	3.850463
1	-7.571499	59.86653	**0.011191**	**1.180130**	**1.476346**	**1.254628**
2	-4.880623	4.211805	0.012681	1.293967	1.787660	1.418130
3	-3.959564	1.281473	0.017005	1.561701	2.252872	1.735529

Source: Computed by author

Results: All of the Lag Selection Criteria (Final prediction error, Akaike information criterion, Schwarz information criterion, and Hannan-Quinn information criterion) select Lag order **one (1)** for econometric models with the variables, FDI and GDPG.

Cointegration Test

Both the variables selected for the study are stationary at level or I(0). In other words, all the variables are integrated in the same order. Hence, Johansen Cointegration model remains optimal for the examination of the cointegrating relationship among the variables in the present study.

Null hypothesis: Variables have no Cointegrating Equation.

Table 3 : Johansen Cointegration test

Cointegration Rank Test (Trace)				
No of CE(s)	Eigen value	Trace Stat.	Critical Value	P-value
None	0.495841	19.75942	15.49471	**0.0107**
At most 1	0.129290	3.322710	3.841466	0.0683
Cointegration Rank Test (Maximum Eigen value)				
No of CE(s)	Eigen value	Max-Egn Stat	Critical Value	P-value
None	0.495841	16.43671	14.26460	**0.0223**
At most 1	0.129290	3.322710	3.841466	0.0683

Source: Computed by author

Results: In both of the tests (Trace test & Maximum Eigen value test) the hypothesis 'none' is rejected but 'at most one' is accepted at 5% significant level. Therefore the Cointegration test indicates that there is **one (1)** cointegrating equation in the selected variables.

Vector Error Correction Model (VECM)

VECM is most commonly used for data where the underlying variables have a long-run stochastic trend or commonly called Cointegration. The result of the cointegration test strongly suggests that there exist one cointegration in the pair of variables. It leads the researcher to select Vector Error Correction Model for checking long-run and short-run impacts of the explanatory variable on the dependent variable.

The VECM equations of two variables (Y and X) which are cointegrated can be written as:

$$\Delta Y_t = \varphi_1 + \delta_{1t} + \lambda_1 e_{t-1} + \gamma_{11}\Delta Y_{t-1} + \ldots + \gamma_{1p}\Delta Y_{t-p} + \omega_{11}\Delta X_{t-1} + \ldots + \omega_{1q}\Delta X_{t-q} + \varepsilon_{1t}$$

$$\Delta X_t = \varphi_2 + \delta_{2t} + \lambda_2 e_{t-1} + \gamma_{21}\Delta Y_{t-1} + \ldots + \gamma_{2p}\Delta Y_{t-p} + \omega_{21}\Delta X_{t-1} + \ldots + \omega_{2q}\Delta X_{t-q} + \varepsilon_{2t}$$

where, $e_{t-1} = Y_{t-1} - \alpha - \beta X_{t-1}$ (Koop, 2005)[14]

Table 4 : Vector Error Correction Estimates

Cointegrating Equation			
Variables	Coint.Equation	Stnd. Errror	t-Statistics
FDI(-1)	1.000000		
GDPG(-1)	-7.854188	1.59579	-4.92182
C	-7.927762		
Error Correction			
Variables	Coint.Equation	Stnd. Errror	t-Statistics
D(FDI)	-0.097816	0.031938	-3.062704
D(GDPG)	0.124927	0.035524	3.516704

Source: Computed by author

Estimate equation of Dependent Variable:

Method: Least Squares Dependent Variable: D(FDI)

Equation: D(FDI) = C(1)*(FDI(-1) - 7.85418818455*GDPG(-1) - 7.92776242421) + C(2)*D(FDI(-1)) + C(3)*D(GDPG(-1)) + C(4)

Results: Coefficient = -0.097816, t- Statistic = -3.062704, Probability = 0.0039.

The error correction coefficient of the dependent variable is negative (-0.097816) and very much significant with p-value 0.0039. It signifies a long run causal relationship running from the independent variable to the dependent variable.

Wald Statistics

Wald statistics is a useful tool for checking short-run association between the variables. It tests the null-hypothesis: c (θ) = 0.

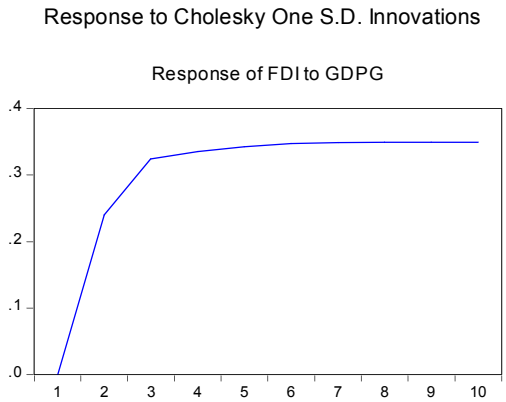
Null Hypothesis: C(3) = 0 or There is no short-run causality running from GDPG to FDI.

Results: Chi-square value = 0.048836 Probability = 0.8251

The Null Hypothesis is accepted at 5% significant level. Therefore, the test signifies that the independent variable (GDPG) have no short-run causal relationship with the dependent variable (FDI).

Impulse Response Function Test

Impulse Response Function (IRF) test is meant for measuring shocks in a VAR system. It is "useful in assessing how shocks to economic variables reverberate through a system" (Lin, 2006)[15]. IRF finds the impact of any variable on the others in a VAR system.



Response of FDI:

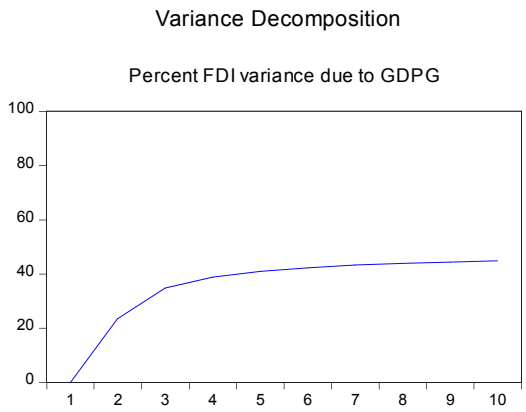
Period	FDI	GDPG
1	0.294900	0.000000
2	0.317652	0.239630
3	0.342099	0.324179
4	0.359061	0.335594
5	0.363622	0.342767
6	0.364891	0.347383
7	0.365627	0.348785
8	0.365943	0.349198
9	0.366042	0.349410
10	0.366081	0.349501

Fig. 2: Impulse Response of Dependent Variable
Source: Computed by author

Results: Impulse Response Function (Figure 2) shows that 1 S.D. positive shock or change in GDPG response positively in FDI in long run. The maximum positive response measured in FDI to the shock in GDPG is 0.3495 units in the 10th year but the response is nil in the 1st year. The units of responses grow gradually from the 2nd year.

Variance Decomposition of Forecast Error Analysis

Variance decomposition can express the percentage of the fluctuation in a time series attributable to other variables at select time horizons. It determines how much of the forecast error variance of each of the variables can be explained by exogenous shocks to the other variables.



Variance Decomposition of FDI:

Period	S.E.	FDI	GDPG
1	0.294900	100.0000	0.000000
2	0.495269	76.59000	23.41000
3	0.683678	65.23115	34.76885
4	0.841999	61.19145	38.80855
5	0.979118	59.04471	40.95529
6	1.101133	57.66557	42.33443
7	1.211539	56.74199	43.25801
8	1.312890	56.08861	43.91139
9	1.407038	55.60161	44.39839
10	1.495300	55.22515	44.77485

Fig. 3: Variance Decomposition of Dependent Variable
Source: Computed by author

Results: Statistics in Figure 3 shows a moderate percentage of variation of fluctuation in the dependent variable caused by shocks to independent variables. Shocks to GDPG cause little variation of fluctuation in FDI in the initial periods. But the percentage of variation grows gradually with increasing period of time (up to 10 years).

Granger Causality Test

In addition to the VECM the study conducts a Granger Causality test to examine the causal relationship between the variables.

Table 5 : Granger Causality Test

Null Hypothesis	F-Statistic	Probability
GDPG does not Granger Cause FDI	1.51659	0.2311
FDI does not Granger Cause GDPG	1.41044	0.2476

Source: Computed by author

Results: None of the Null hypotheses are rejected at the 5% significant level. Hence, the test suggests that GDP Growth Rate does not cause a significant change in the FDI inflows and the vice versa.

Model Selection and Diagnostic Statistics

Model Selection and Diagnostic is necessary for checking whether a model is appropriately selected for empirical analysis. The study selects Vector Error Correction Model (VECM)for finding effects of explanatory variables on the dependent variable. This diagnostic is done with Serial Correlation test, and Normality test of the residuals of the model.

Table 6 : VEC Residual Serial Correlation LM Test

H_0 = No Serial Correlation		
Lags	LM-Statistic	Probability
1	4.215237	0.3777
2	3.068755	0.5464
3	1.743008	0.7829
4	5.126144	0.2746
5	0.607344	0.9622
6	2.406710	0.6614
7	8.407431	0.0777
8	1.904077	0.7534

Source: Computed by author

Result: The Null-hypothesis (no serial correlation in the VEC residuals) is accepted at 5% significant level up to the 8th lag. Therefore, the result (Table 5) shows that there is no serial correlation in the equation.

Null Hypothesis: Residuals are multivariate normal

Table 7 : VEC Residual Normality Test

Component	Jarque-Bera	df	Probability
1	0.671566	2	0.7148
2	1.555333	2	0.4595
Joint	2.226899	4	0.6941

Source: Computed by author

Result: The normality test shows that the residuals of the model are normally distributed. The Jarque-Bera p-values confirm the acceptance of the Null hypothesis.

Conclusion & Suggestions

The purpose of the present study was to examine the impact of GDP Growth Rate of India on the FDI Inflows in the country during the selected period of time. The results of the Granger Causality test suggest that GDP Growth Rate does not cause any significant change in the FDI inflows in India. On the other hand, the VEC regression indicates a long run causality running from GDP Growth Rate to FDI Inflows. But no short-run causal relationship has been found in the Wald test result. Without the causality in the short run an absolute influence of the

explanatory variable on the dependent variable cannot be assured. Hence, it can be concluded that the impact of GDP Growth Rate on the FDI Inflows in the post-liberalized India has not been confirmed by the study.

In fact, there are good many factors that determine the FDI flows to countries. The factors, especially economic factors and policy factors have great influence on FDI flows to an economy. Therefore, GDP growth rate alone cannot determine the FDI inflows in India. It is evident that the country's GDP growth rate was not consistent in the post-liberalized period. But the country has experienced a high growth of inward FDI in the recent years. It is perhaps the impact of FDI related policies taken by the Government of India in the recent past.

Keeping an eye to a further growth of FDI inflows in the country the study suggests the governments (central & states) to make business and investment related policies that may attract the foreign investors to India.

Limitation of the Study

Present study examines the influence of GDP growth rate on the FDI inflows in the context of liberalized India. Thus, the period of the study is limited to 27 years only. Besides, the study considers only one explanatory variable GDP Growth Rate to test its influence on FDI inflows. But there are many other determinants of FDI (already identified by the empirical studies) those are not considered within the limited scope of this study.

Scope of Further Research

The study suggests that not only the economic factors but there are some policy determinants that have great influence on the FDI inflows to a country. Hence, there is a scope for further research for identifying the non-economic factors that may influence India's Inward FDI.

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