

The Role of Foreign Direct Investment in the Indian Economic Growth

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Abstract: This research paper aims to assess the role of Foreign Direct Investment (FDI) on India's Gross Domestic Product (GDP). FDI refers to the acquisition of controlling ownership in a business entity in another country through means such as joint ventures or share purchases. FDI is widely recognized as a crucial driver of economic development, both in developing and developed countries. To analyze the role of FDI on India's GDP, data spanning from 1970 to 2020 is utilized. The research relies on secondary data obtained from various sources, including the World Bank, Reserve Bank of India (RBI), UNCTAD, and others. The study utilizes time series data analysis techniques such as Correlation, Regression, Co-integration, and CHOW Test to explore the association between FDI and GDP. The findings indicate structural changes in FDI patterns in 1991 and 2008, but in the long run, there is a positive significant relationship between FDI and India's GDP growth.

Keywords: Foreign Direct Investment (FDI), Co-integration, Structural Break, CHOW Test.

1. INTRODUCTION

Foreign direct investment (FDI) refers to the financial investment made by a foreign entity in a company, where the foreign investor gains control over the purchased firm. It involves investing in a company located in another economy by a resident of a different economy. FDI contributes significantly to a country's economic development. In the case of India, FDI has played a vital role in fostering financial stability, prosperity, and overall growth. The inflow of FDI has enabled India to address areas in need of economic support and tackle the various challenges the country faces. According to the Department for Promotion of Industry and Internal Trade (DIPP), FDI inflows to India reached \$81.7 billion in the fiscal year 2020-21. Additionally, the World Investment Report 2021 states that India was the fifth-largest recipient of FDI globally in 2020. Out of that 27 percent investment driven by IT sector. Despite regional lockdowns and economic downturns caused

by the pandemic, both sets of data indicate that India is on a sustained growth trajectory and remains an attractive and viable investment destination for foreign investors.

2. REVIEW OF LITERATURE

The authors Lakshmi K and Dr. V. A Chowdappa (2021), focused on the trends and patterns of FDI inflow in India. CVID-19 impact on FDI inflow(Dr. R. VENNILA.(2021), Dr. B. China VenkataLingaiah (2021) studied the influence of FDI on the country's economic growth and assessed the impact of FDI on India's GDP in 2002-2013, Velu Suresh Kumar (2021) the study suggests that the Indian government's recent adjustments to the FDI policy framework. Ms. Manisha Pawar, Nidhi Argade (2021) FDI inflows in to the pharmaceutical industry, Pankaj Kumar (2020), India experienced several structural changes in a variety of sectors through FDI inflow, Deepak Kumar (2020), Ms. Ishita N. Shah (2020) researcher had tried to establish the linkage between the effects of FDI inflows on India's services, construction, trading, mining, and agricultural sectors, Dr. PoojaKumari (2020), the impact of FDI on India's unorganized retail sector and the impact of FDI on agricultural products N. Kannan (2020), Dr. P. Sai Rani and Sourav Kumar Ghosh (2020)researchers investigated the relationship between GDP growth rate, foreign direct investment, and employment in India, Ronismita Mishra, Swapnamoyee Palit (2020) level of impact that foreign direct investment has on the Indian banking industry in the aftermath of the unusual capital outflow from the Indian economy during the recent global economic downturn, M. Manida (2019) examined the importance of foreign direct investment in the Indian insurance industry and also assessed the performance of India's non-life insurance sector, M. Surya, B. Sudha and T. Priyanka (2019).

3. RESEARCH GAP

The previous studies primarily examined the effects of FDI on overall economic growth and sector-specific growth. However, none of these studies specifically compared FDI inflows and GDP growth before and after the liberalization period in India. This present study aims to address that gap by comparing FDI inflows and GDP growth during the period before and after liberalization (1970-2010). Additionally, the study focuses on analyzing the long and short-run relationship between FDI and GDP from 1970 to 2021, while also identifying any structural breakdowns in the time series data.

4. OBJECTIVES

1. To highlight the significance of FDI inflows to the Indian economy
2. To examine the relationship between FDI inflows and India's GDP growth.

5. HYPOTHESIS

H0: There is no positive relationship between FDI inflows and GDP growth.

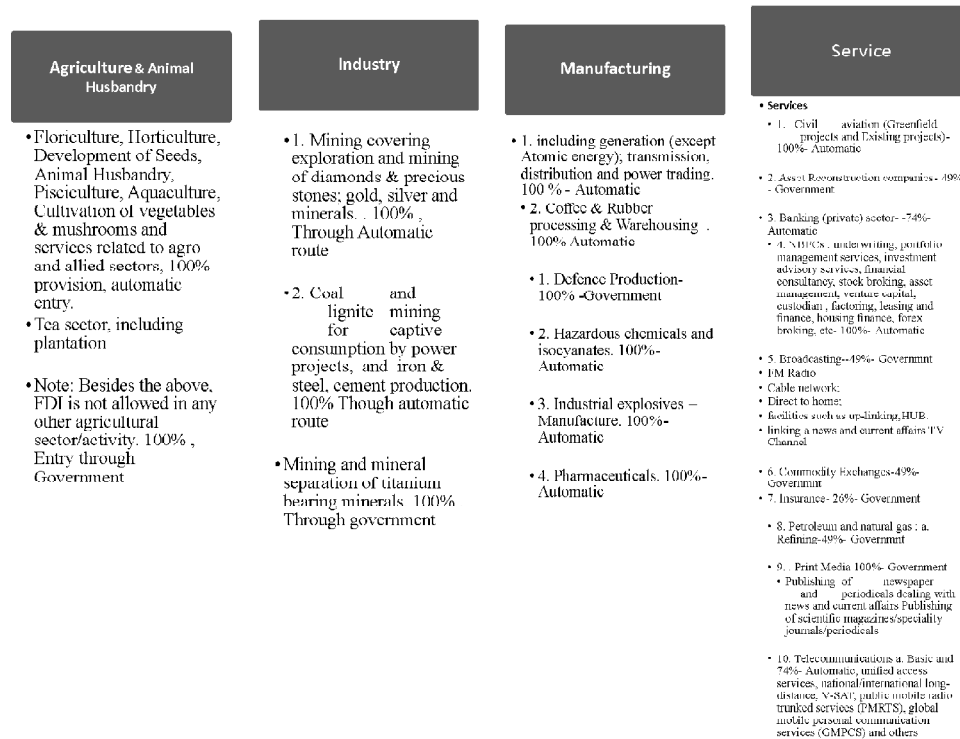
H1: There is a positive relationship between FDI inflows and GDP growth.

6. METHODOLOGY

This study is based on secondary data. The required data has been obtained from different sources like the World Bank, RBI, UNCTAD etc. The study is based on time series data from 1991 to 2020. To analyze the data and descriptive statistics, correlation, regression, Co-integration, CUSUM Test, and CHOW tests were used. The study analyzed the relationship between FDI and GDP in India since 1991 by using co-integration analysis.



Flow Chart 2: Methodology



Flow Chart- Sector Specific Limits of Foreign Investment in India

7. SECTOR WISE ENTRY ROUTES OF FDI TO INDIA

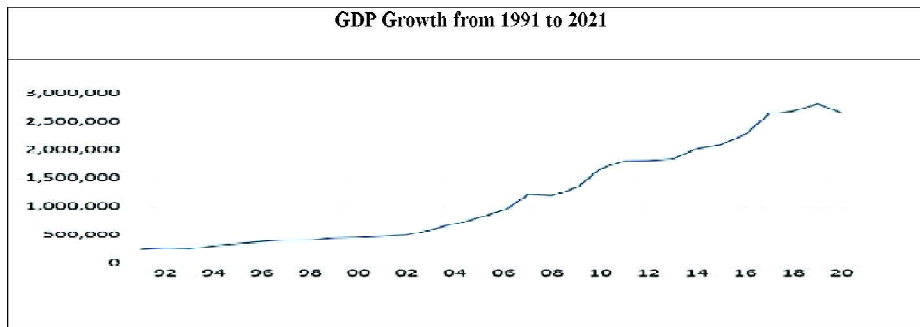
Investments by non-residents in a country can be made by two routes: Automatic route and government route. In Automatic Route, non-resident investors or Indian companies do not need consent from the Government of India for their investments. In other case, the Government Route requires prior approval from the Government of India. Proposals for foreign investment through Government Route are evaluated by the relevant Administrative Ministry/Department.

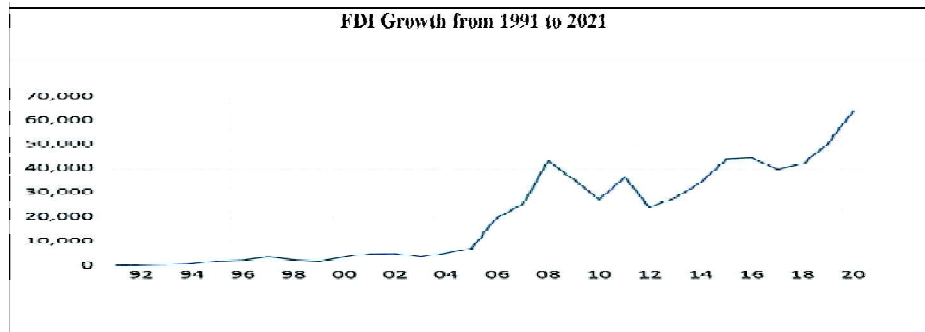
To know the relationship of FDI inflow and GDP growth in last 30 years' time, conducting co-integration analysis for time series data from 1991 to 2020. The table-1 and graphs shows Foreign Direct Investment (FDI) inflows and Gross Domestic Product (GDP) since 1991 to 2020. It is observed that, FDI is \$ 73.54 million in 1991 which increased to \$64362.36 million in 2020 and GDP is \$ 270105.34 million in 1991 which increased to \$ 2667687.95 million in 2020.

Table 1: FDI Net Inflows and GDP (1991-2010), (in Million \$)

Year	FDI	GDP Growth	Year	FDI	GDP Growth
1991	73.54	270105.34	2006	20029.12	940259.89
1992	276.51	288208.43	2007	25227.74	1216735.44
1993	550.37	279296.02	2008	43406.28	1198895.58
1994	973.27	327275.58	2009	35581.37	1341886.60
1995	2143.63	360281.95	2010	27396.89	1675615.34
1996	2426.06	392897.05	2011	36498.65	1823049.93
1997	3577.33	415867.75	2012	23995.69	1827637.86
1998	2634.65	421351.48	2013	28153.03	1856722.12
1999	2168.59	458820.42	2014	34576.64	2039127.45
2000	3584.22	468394.94	2015	44009.49	2103587.81
2001	5128.09	485441.01	2016	44458.57	2294797.98
2002	5208.97	514937.95	2017	39966.09	2651472.95
2003	3681.98	607699.29	2018	42117.45	2702929.72
2004	5429.25	709148.51	2019	50610.65	2831552.22
2005	7269.41	820381.60	2020	64362.36	2667687.95

Source Databank. World Bank





8. DESCRIPTIVE STATISTICS

Table 2: Descriptive Statistics

	GDP	FDI
Mean	1199736	20183.86
Median	880320.7	13649.27
Maximum	2831552.	64362.36
Minimum	270105.3	73.54000
Std.Dev.	873198.5	19297.75
Skewness	0.554999	0.516782
Kurtosis	1.846943	1.955555
Jarque-Bera	3.202043	2.698899
Probability	0.201690	0.259383
Sum	35992066	605515.9
SumSq. Dev.	2.21E+13	1.08E+10
Observations	30	30

Source: Author’s calculation

The essential properties of the data in a study are described using descriptive statistics. The summary of the statistics is shown in Table-2. The result shows that GDP and FDI both have a long-right tale (positive skewness) and leptokurtic (because Kurtosis value is >3). GDP and FDI both passed the Jarque-Bera test and it is normally distributed.

8.2. Correlation Matrix

The variables in our study are FDI and GDP and the results of the correlation values among the variables are shown in Table 10. The below correlation coefficient shows there is a strong correlation between FDI and GDP.

Table 3: Correlation Matrix for the variables used

	<i>FDI</i>	<i>GDP</i>
<i>FDI</i>	1	0.93343
<i>GDP</i>	0.93343	1

To understand the long run relationship and Short run relationship between the GDP and FDI co-integration techniques were employed. To fulfill the time-series properties the data are tested through ADF (Augmented Dickey Fuller Test).

8.3. Unit Root Test

The condition for a variable to be considered stationary is that its mean and variance remain constant over time, and the covariance between two time periods only depends on the time gap between them. If this condition is not met, it indicates a non-stationary problem. The ADF test is employed as a means to address and correct this non-stationary issue.

H_0 : The data is not stationary.

H_1 : The data is stationary.

Table 4: Results of Unit Root Test-ADF Test for the variables used

<i>Variable</i>	<i>At Level</i>		<i>At First Difference</i>	
	<i>Constant</i>	<i>Const & Trend</i>	<i>Constant</i>	<i>Const & Trend</i>
<i>GDP</i>	0.9958	0.5669	0.0007**	0.0214**
<i>FDI</i>	0.9756	0.4937	0.0004**	0.0016**

Note: **Indicates rejection of Null Hypothesis at 5% level of significance

*MacKinnon(1996) one-sided p-values.

8.4. Regression

$$GDP_t = \alpha_0 + \beta_1 FDI + E_t$$

Dependent Variable: GDP

Method: Least

Squares Date: 08/04/22

Time: 11:07

Sample: 19912020

Included observations: 30

<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Prob.</i>
<i>FDI</i>	42.23662	3.067774	13.76784	0.0000
<i>C</i>	347237.5	84982.22	4.086001	0.0003

R-squared	0.871296	Mean dependent var	1199736.
Adjusted R-squared	0.866699	S.D.dependentvar	873198.5
S.E.of regression	318807.9	Akaikeinfocriterion	28.24691
Sums quaredresid	2.85E+12	Schwarzcriterion	28.34032
Loglikelihood	-421.7036	Hannan-Quinncrier.	28.27679
F-statistic	189.5534	Durbin-Watsonstat	1.033143
Prob(F-statistic)	0.000000		

There is a significant relationship between FDI inflow and GDP growth as FDI increases by 1\$ million the GDP will also increases by 42.23\$ million over a period of time.

8.5. Co-integration

To test the empirical relationship between GDP and FDI the co-integration techniques is used

Ho:There is a no co-integration

H1:There is a co-integration

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.756320	71.65351	25.87211	0.0000
At most 1 *	0.377319	18.00140	12.51798	0.0055

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
 * denotes rejection of the hypothesis at the 0.05 level
 **Mackinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.756320	53.65210	19.38704	0.0000
At most 1 *	0.377319	18.00140	12.51798	0.0055

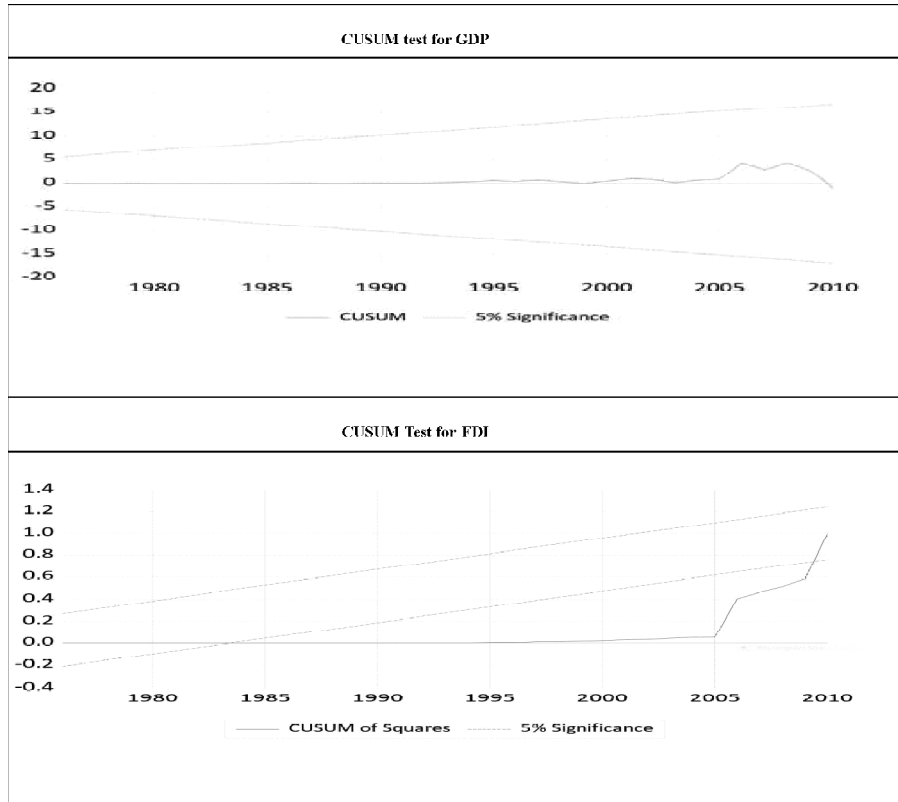
Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
 * denotes rejection of the hypothesis at the 0.05 level
 **Mackinnon-Haug-Michelis (1999) p-values

The above result shows the GDP and FDI exhibits the long-run relationship over a period of time.

8.6. CUSUM Test

CUSUM chart monitors the small shift in the process of mean based on samples taken from the given time. The CUSUM chart shows accumulation

of information of current and previous samples which detecting specification of a target value and reliable estimates of the standard deviation.



From the above CUSUM graphs it is clear that the data of GDP follows a random walk on independent normal data and FDI is not following the random-walk on independent normal data.

8.7. CHOW Test

CHOW test is used to identify whether or not the regression coefficients of each regression models on different data sets are equal. This test used to determine if there is a structural breakdown in the data at some point.

The test determines that coefficients are not equal between regression line, this means. The above results shows that there is significant structural breakdown in the data of GDP in 1991 and 2007 it is because of the LPG reforms in 1991 and US financial crisis in 2007.

<p>Chow test for GDP (2007)</p> <p>Chow Breakpoint Test: 2007</p> <p>Null Hypothesis: No breaks at specified breakpoints/varying regressors: All equation variables</p> <p>Equation Sample: 1970-2010</p> <table border="1"> <tbody> <tr> <td>F-statistic</td> <td>80.65168</td> <td>Prob. F(1, 39)</td> <td>0.0000</td> </tr> <tr> <td>Log likelihood ratio</td> <td>48.62543</td> <td>Prob. Chi-Square(1)</td> <td>0.0000</td> </tr> <tr> <td>Wald Statistic</td> <td>88.65196</td> <td>Prob. Chi-Square(1)</td> <td>0.0000</td> </tr> </tbody> </table> <p>Chow test for GDP (1991)</p> <p>Chow Breakpoint Test: 1991</p> <p>Null Hypothesis: No breaks at specified breakpoints/varying regressors: All equation variables</p> <p>Equation Sample: 1970-2010</p> <table border="1"> <tbody> <tr> <td>F-statistic</td> <td>28.43692</td> <td>Prob. F(1, 39)</td> <td>0.0000</td> </tr> <tr> <td>Log likelihood ratio</td> <td>22.43402</td> <td>Prob. Chi-Square(1)</td> <td>0.0000</td> </tr> <tr> <td>Wald Statistic</td> <td>29.19462</td> <td>Prob. Chi-Square(1)</td> <td>0.0000</td> </tr> </tbody> </table>	F-statistic	80.65168	Prob. F(1, 39)	0.0000	Log likelihood ratio	48.62543	Prob. Chi-Square(1)	0.0000	Wald Statistic	88.65196	Prob. Chi-Square(1)	0.0000	F-statistic	28.43692	Prob. F(1, 39)	0.0000	Log likelihood ratio	22.43402	Prob. Chi-Square(1)	0.0000	Wald Statistic	29.19462	Prob. Chi-Square(1)	0.0000	<p>Chow test for FDI (1991)</p> <p>Chow Breakpoint Test: 1991</p> <p>Null Hypothesis: No breaks at specified breakpoints/varying regressors: All equation variables</p> <p>Equation Sample: 1970-2010</p> <table border="1"> <tbody> <tr> <td>F-statistic</td> <td>11.90557</td> <td>Prob. F(1, 39)</td> <td>0.0014</td> </tr> <tr> <td>Log likelihood ratio</td> <td>10.82294</td> <td>Prob. Chi-Square(1)</td> <td>0.0069</td> </tr> <tr> <td>Wald Statistic</td> <td>11.90557</td> <td>Prob. Chi-Square(1)</td> <td>0.0066</td> </tr> </tbody> </table> <p>Chow test for FDI (2007)</p> <p>Chow Breakpoint Test: 2007</p> <p>Null Hypothesis: No breaks at specified breakpoints/varying regressors: All equation variables</p> <p>Equation Sample: 1970-2010</p> <table border="1"> <tbody> <tr> <td>F-statistic</td> <td>199.3925</td> <td>Prob. F(1, 39)</td> <td>0.0000</td> </tr> <tr> <td>Log likelihood ratio</td> <td>74.05255</td> <td>Prob. Chi-Square(1)</td> <td>0.0000</td> </tr> <tr> <td>Wald Statistic</td> <td>199.3925</td> <td>Prob. Chi-Square(1)</td> <td>0.0000</td> </tr> </tbody> </table>	F-statistic	11.90557	Prob. F(1, 39)	0.0014	Log likelihood ratio	10.82294	Prob. Chi-Square(1)	0.0069	Wald Statistic	11.90557	Prob. Chi-Square(1)	0.0066	F-statistic	199.3925	Prob. F(1, 39)	0.0000	Log likelihood ratio	74.05255	Prob. Chi-Square(1)	0.0000	Wald Statistic	199.3925	Prob. Chi-Square(1)	0.0000
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8.8. Conclusion

FDI plays a crucial role in enhancing the economic growth and development of the country. Moreover, FDI as a strategic component of investment is needed by India to achieve the objectives of its second generation of economic reforms and maintain the pace of growth and development of the economy. Hence, FDI is a significant factor that influences the level of economic growth in India. Results of the Johansen Co-integration Test demonstrated a long-run association between variables.

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