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Determinants of Foreign Direct Investment Inflows in India and its Impact on GDP: An Empirical Analysis

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ABSTRACT

Purpose: The purpose of the study is to examine the determinants of foreign direct investment inflows into India and its impact on gross domestic product of the economy. The study also indicates the trend of foreign direct investment inflows in India since 1991-2016.

Data source: The study use the secondary data collected from different sources like, United Nations Conference on Trade and Development, World Bank, International Monetary Fund.

Study period: The study period isfrom 1991 to 2016.

Methodology: The study applies regression model for empirical analysis. For accurate results of the econometric model small variances is required. In order to minimize the variance from variables we have taken log of the variables. The least square method is used for the estimation of relationship between the dependent and independents variables. For checking Multicollinearity among the independent variables correlation is used. The Breusch-Godfrey Serial Correlation LM Test is used for testing autocorrelation and Breusch-Pagan-Godfrey test is used for testing the Heteroskedasticity in the residuals.Jarque-Bera test is used for testing the normality of the data.

Findings: The study finds that there is a positive relationship between foreign direct investment and gross domestic product of the economy. The study also finds that there is a negative relationship between foreign direct investment and inflation (CPI).

Keywords:*CPI, foreign direct investment, gross domestic product, Indian Economy, LPG.*

I.INTRODUCTION

After the liberalization privatization and globalization (LPG) in 1991, India became the most favorable and investor-friendly destination. The abolition of license raj and introduction of newconcept of LPG have been pulling the foreign investment into India, it may be in the form of foreign direct investment (FDI), foreign

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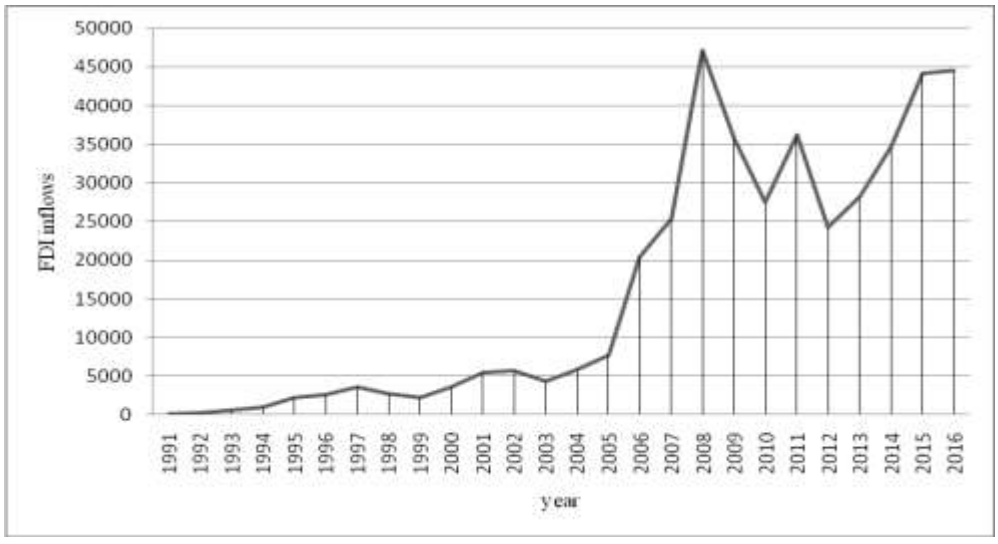
portfolio investment (FPI), foreign institutional investment (FII),These foreign investments playing a major role in the growth and development of Indian economy. The foreign direct investment is a non-debt capital flow and considered a major external source of financing the needed sectors of the developing countries. It does not brings only the capital and advance technology but also increase the country's gross domestic product (GDP) with new employment generation and increment in the productivity by the usage of advance technology, skilled labor and available underutilized resources. In 13th April, 1992 the government of India signed Multilateral Investment Guarantee Agency (MIGA) to assure the foreign investor for their protection. In 1973 foreign exchange regulation act (FERA) was passed which aims to impose restriction on the foreign exchange and replaced by the government of India in the budget of 1997-98 with foreign exchange management act (FEMA) which was come into force June 1, 2000. In foreign exchange management act the restriction which were imposed on foreign exchange market under foreign exchange regulation act was liberalized which result more attraction of foreign investment into India.

Foreign investments, especially FDI, not only supplements domestic investment resources but also act as a source of foreign exchange and can ease balance of payment constraints on growth. India is a competitor in the market for FDI inflows, with the other developing economies. The empirical literature suggest that foreign direct investment raises national welfare by increasing the volume and efficiency of investment through improved competitiveness, technological diffusion, accelerated spillover effects and the accumulation of human capital (Banga, 2004).

II.TREND OF FDI INFLOWS INTO INDIA

In the below chart the trends of FDI inflows in India after liberalization is shown: fig. 1



Source: UNCTAD

In the above chart it have seen that there is a trend in the inflows of the foreign direct investment and the lowest value of FDI was in 1991 which was only 75 US$ million and it continuously increase and reached at 47102.41727 US$ million in 2008 which is the highest value of FDI inflows in India. And after 2008 it starts to decline and in 2010 it becomes 27417.07666. After 2012 it has seen that there is an increase of FDI inflows into India. The Make in India initiative taken in 2015 by the government of India also playing a very significant role in the attraction of FDI inflows into India.

III.THEORETICAL FRAMEWORK

The variables which are taking into consideration for this study have selected because of two reasons:

i. These variables plays very important role in attracting the foreign direct investment inflows into India and
ii. The availability of data for selected study period of selected variables.

The econometric model that we planned to apply into the study is:

FDII= F (GDP, GCF, EX, IM, ER, CPI)

Where:

FDII = Foreign Direct Investment Inflows for current (unit $ million)

GDP = Gross Domestic Productat current (unit $million).

GCF = Gross Capital Formation at current(unit $ million).

EX = Export at current (unit $ million).

IM = Import at current (unit $ million).

ER =Exchange Rate (unit per us$).

CPI = Inflation (CPI base 2005).

The reason behind the selection of these explanatory variables is that these variables play a significant role in the attraction of FDI inflows. Gross domestic product signifies the economy's output per year. It is expected that if an economy's output is increasing in size then it should attract FDIs as the foreign investors will like to be a part of the growth story. This of course, is dependent on the law and regulations, which is if FDI inflows are allowed in the sectors of the economy that are seeing increase. But given no restriction to FDI inflows, there is a bond to be a relationship with increased/decreased GDP and correspondingly FDI inflows (singhania and gupta, 2011). Inflation rate affects FDI in terms of capital preservation. It is both internal and external factor. If an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investor is looking to invest in the country then he would like to invest where the inflation is low and/or corresponding to the return that is the returns should be high above the inflation rate to get net profit/returns. And so higher inflation rates with not correspondingly higher returns will switch off investors and can lead to loss of FDI (singhania and gupta, 2011).

IV.REVIEW OF LITERATURE

Sunet al. (2002)provided evidence that the importance of FDI determinants moves through time. Wage has positive relationship with FDI before 1991 but has a negative relationship after 1991. Similarly, provincial GDP bears no significant relationship with GDP before 1991 but becomes highly positive after 1991. This reflects the fact that the nature of FDI before and after 1991 is quite different. Labour quality and infrastructure are also important determinants of the distribution of FDI. High labour quality and good infrastructure attract foreign investors. For a country as a whole, it political stability and its openness to the foreign world add another important dimensions to drawing in foreign capital.

Carkovic and Levine (2005) examined the effect of FDI on economic growth and concluded that FDI had no impact on long-term economic growth. They used a panel data set covering 72 developed countries in order to analyze the relationship between FDI inflows and economic growth. They argued that the lack of positive impact of FDI on economic growth is not conditional upon human capital, the level of economic development or openness of the economy.

Azam, M. and Lukman, L., (2010) The empirical result revealed that the most important economic variable found were market size that shows a country's development levels permit the exploitation of economies of scale which is likely to increase the attractiveness of FDI vis-à-vis alternative forms of internationalization. The external debt burden is like a distinctive for FDI as found with negative relationship between this variable and FDI inflow. The effects of infrastructure facilities are positively significant in explaining inflow of FDI. To enhance more FDI into India, Pakistan and Indonesia, the management authorities of each respective country needs to ensure stable economic and political environment, provision of physical quality infrastructure, maintaining inflation rate, encourage domestic investment, financial incentives, reduce duties, peace and security, law and order situation and consistency in the government policy because these all are the key factors for potential investors in making investment choices.

Singhania, M. and Gupta, A., (2011) found that of all macroeconomic variables taken, only GDP, inflation rate and scientific research are significant and that fdi policy changes during years 1995-1997 have had a significant impact on fdi inflows into india. The author suggested that the government of India gives resources towards variables that have been classified as significant in the study namely GDP growth and inflation rate and should open the economy further. Sectors not yet open to fdi should be open and although inflation rate should control but some inflation is beneficial.


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Nurudeen, A., et. al(2011) "analyzed that openness of the economy, privatization, the level of infrastructural development and exchange rate depreciation have a significant positive effect on FDI inflows into Nigeria. In addition, the results reveal that the host country's market size (GDP) has a significant negative effect on FDI, while inflation has an insignificant (but positive influence on FDI inflows. thus the study suggested that the government should employ policies to further open up the economy us a manner that the economy will be able to attract more FDI. government should increase its investment in the development of the nation's infrastructure (power supply, roads, telecommunication, etc.) in order to reduce the cost of doing business thereby wooing more FDI. The government should encourage production activity via production incentives and/or subsidies in order to increase the economy's GDP. The economy should be ready to accommodate further depreciation of domestic currency so as to encourage the FDI inflows in the form of merger and/or acquisition. Furthermore, privatization should be done in a manner that is transparent, and all necessary and relevant information regarding the process should be made available to both existing and prospective investors".

Liargovas, P.G. and Skandalis, K.S., (2012) "examined the importance of trade openness for attracting foreign direct investment inflows. The main empirical finding of the study is that in the long run, trade openness contributes positively to the inflow of FDI in the developing countries".

Farkas (2012) "tested the effect of FDI on GDP by doing the regression analysis and concluded the results that FDI has positive relationship with GDP and its impact depend upon the absorptive capacity of the host country, level of human capital and development of the financial markets".

Jadhav, P., (2012) "shows that traditional economic determinants are more important than the institutional and political determinants of FDI. Most of the FDI in BRICS economies are motivated by the market-seeking purpose. Most of the institutional and political determinants are not statistically significant and voice and accountability shows negative coefficient that the investors from countries with high corruption and the lack of enforcement of anticorruption laws select similar countries when they internationalize in order to exploit their familiarity with corrupt environments and also because they face lower costs of operating as opposed to other investors".

Parvathi, H., (2015) "founds that the economic determinants such as export and foreign exchange reserves are factors influencing FDI inflows into India. Further, the macro – economic determinants having significant influence on FDI inflows into the country are found to be foreign exchange reserves and exports".

Murugesan, Ramasamy (2016) "founded that the effects of FDI spillover on regional productivity in India using stochastic frontier and panel data from 28 states over 1993-2013 show that R&D, technology import, human capital, and various specifications of FDI have a significant impact on the regional productivity in India except technology gap. This empirical study on regions appears reasonable to suggest that state governments and regional development officials might reconsider policies that grant financial incentives to entice FDI".

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Research design:

Objectives of the study

The primary objective of the study is:

- To examine the impact of foreign direct investment (FDI) on gross domestic product (GDP).

The study has some secondary objectives these are:

- To analyze the trends, growth and patterns of FDI inflows into India after globalization.
- To examine the determinants of FDI flows in India after globalization.

Data source

There are various sources from where we have collected data. The study has taken the annual data of dependent variable FDI inflows at current US$ millions from United Nations Conference on Trade and Development (UNCTAD).The annual data of explanatoryvariables like, Gross Domestic Product (GDP), Gross Capital Formation (GCF), Export (EX), Import (IM), has taken from World Bank (databank-world development indicator). The Exchange Rate (ER) data has taken from international monetary fund (IMF) and the inflation rate (CPI) per US$ at base 2005 data collected from United Nations Conference on Trade and Development (UNCTAD).

Time period

The study period isfrom 1991 to 2016 because the abolition of license raj and introduction of LPG conceptin 1991 start to attractthe foreign direct investmentand a successful journey start for the growth and development of Indian economy.

Methodology

The study appliesregression model for empirical analysis. For accurate results of the econometric model small variances is required. In order to minimize the variance from variables we have taken log of the variables. For instance the variable FDI is now Log (FDI). The least square method is used for the estimation of relationship between the dependent and independents variables. For checking Multicollinearity among the independent variables correlation is used. The Breusch-Godfrey Serial Correlation LM Test is used for testing autocorrelation and Breusch-Pagan-Godfrey test is used for testing the Heteroskedasticity in the residuals.Jarque-Bera test is used for testing the normality of the data.

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Model

The functional form for the determinants of FDI inflow of the Indian economy at the macro level using annual data can be written as

FDI= F (GDP, GCF, EX, IM, ER, Inflation)

More specifically, we can write

$FDII= \alpha + \beta_1 GDP + \beta_2 GCF + \beta_3 EX + \beta_4 IM + \beta_6 ER + \beta_7 CPI + \varepsilon.$

Where α is the interception of FDI and βs are the parameter and ε is the error term or residual.

In order to minimize the variances we are taking log of the variables. After log the above equation became as follows:

$Log\ (FDI) = \alpha + \beta_1 logGDP + \beta_2 logGCF + \beta_3 E\ logEX + \beta_4 logIM + \beta_6 logER + \beta_7 logCPI + \varepsilon_t$

Analysis and Findings

Dependent Variable: LOG_FDI_
Method: Least Squares
Date: 02/12/18 Time: 15:01
Sample: 1 26
Included observations: 26

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-69.66745	29.01101	-2.401414	0.0267
LOG_GDP_	7.987402	4.550442	1.755303	0.0953
LOG_GCF_	-2.602309	2.476478	-1.050811	0.3065
LOG_EX_	-6.354423	2.594105	-2.449563	0.0242
LOG_IM_	7.562555	2.696042	2.805058	0.0113
LOG_ER_	11.07807	3.447273	3.213574	0.0046
LOG_CPI_	-11.83200	5.110635	-2.315173	0.0319

R-squared	0.949638	Mean dependent var	3.806269
Adjusted R-squared	0.933734	S.D. dependent var	0.749472
S.E. of regression	0.192931	Akaike info criterion	-0.228165
Sum squared resid	0.707224	Schwarz criterion	0.110553

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Log likelihood	9.966148	Hannan-Quinn criter.	-0.130627
F-statistic	59.71090	Durbin-Watson stat	1.647740
Prob(F-statistic)	0.000000		

Log (FDI) is the dependent variable. The least squares estimation is used for the estimation of FDI inflows and its impact on GDP and the relationship between FDI and other independent variables. The value of R^2 is0.9496 which means 94.96% variations in FDI inflows in India. This is quite good. The explanatory variables except GCF are significant because the p-value is less than 5%. But the variable gross capital formation (GCF) is insignificant because the p-value is greater than 5%. The f-statisticsis 59.71 and corresponding p-value is 0.0000 which is less than 5% meaning is that the f-statistic is also significant. F-statistic significant means the independent variables are jointly influences the dependent variable which is a good sign for a model.

Multicollinearity:

	LOG_CPI_	LOG_ER_	LOG_EX_	LOG_GCF_	LOG_GDP_	LOG_IM_
LOG_CPI_	1.000000	0.927248	0.965258	0.954089	0.977283	0.960169
LOG_ER_	0.927248	1.000000	0.827244	0.801982	0.834617	0.818551
LOG_EX_	0.965258	0.827244	1.000000	0.996048	0.992875	0.998975
LOG_GCF_	0.954089	0.801982	0.996048	1.000000	0.991801	0.997040
LOG_GDP_	0.977283	0.834617	0.992875	0.991801	1.000000	0.990552
LOG_IM_	0.960169	0.818551	0.998975	0.997040	0.990552	1.000000

The independent variables should not have high correlation among them and should be unique so that each one can be counted as separate and so we have checked the correlation among the independent variables. And the result shows that there is no Multicollinearity among the explanatory variables and so all of them is good for the model.

Serial correlation:

$H_{0:}$ residual are not serially correlated.

H_1: residual are serially correlated.

Breusch-Godfrey Serial Correlation LM Test:

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F-statistic	0.353943	Prob. F(2,17)	0.7070
Obs*R-squared	1.039369	Prob. Chi-Square(2)	0.5947

The observed R^2 and corresponding p-value is 59.47% which is greater than 5% so we cannot reject the null hypothesis (H_0). Meaning is that there is no serial correlation in the residual.

Heteroskedasticity:

$H_{0:}$ residual are not Heteroskedastic.

$H_{1:}$ residual are Heteroskedastic.

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.129902	Prob. F(6,19)	0.3827
Obs*R-squared	6.837421	Prob. Chi-Square(6)	0.3361
Scaled explained SS	3.584421	Prob. Chi-Square(6)	0.7327

Normally we choose the observed R^2 and corresponding p-value that is 33.61% and is more than 5% so we cannot reject the null hypothesis (H_0). Meaning is that there is no Heteroskedasticity in the residual that is desirable.

Normality distribution:

$H_{0:}$ residual are normally distributed.

H_1: residual are not normally distributed.

Jarque-Bera	Probability
0.008963	0.995529

The jarque-Bera and corresponding p-value is 99.55% which is more than 5% so we cannot reject the null hypothesis (H_0) which means residuals are normally distributed.

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Summary and conclusion

We tried to find out the factors determining the FDI inflows in India and the impact of FDI inflows on GDP. The independent variables which are considered as the determinant factors of FDI inflows are GDP, gross capital formation, export, import, exchange rate and consumer price index. The study found that there is a positive relationship between foreign direct investment and gross domestic product of the economy which means there is a positive impact of foreign direct investment on gross domestic product (GDP). The study found that there is a negative relationship between foreign direct investment and inflation (CPI). The study also found that there is negative relationship between foreign direct investment inflows and export. We have found that GDP, import and exchange rate are significant in explaining the variation in FDI inflows into India. In addition we have seen in the chart that the change in policies and taking initiative for more FDI inflow has had significant impact on the FDI inflow into India.

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Appendix 1.The data for different variables from 1991-2016.

years	FDI	GDP	GCF	EX	IM	ER	CPI
1991	75	2.665E+11	6.475E+10	2.288E+10	2.289E+10	22.74	39.567845
1992	252	2.844E+11	7.301E+10	2.541E+10	2.757E+10	25.92	44.231955
1993	532	2.756E+11	6.815E+10	2.738E+10	2.735E+10	30.49	47.045947
1994	974	3.229E+11	8.899E+10	3.227E+10	3.327E+10	31.37	51.850119
1995	2151	3.555E+11	1.001E+11	3.895E+10	4.322E+10	32.43	57.151646
1996	2525	3.877E+11	1.023E+11	4.068E+10	4.525E+10	35.43	62.282274
1997	3619	4.103E+11	1.169E+11	4.433E+10	4.949E+10	36.31	66.744344
1998	2633	4.157E+11	1.121E+11	4.629E+10	5.331E+10	41.26	75.575209
1999	2168	4.527E+11	1.344E+11	5.239E+10	6.117E+10	43.06	79.104396
2000	3587.9897	4.621E+11	1.25E+11	6.07E+10	6.497E+10	44.94	82.276137
2001	5477.6376	4.79E+11	1.294E+11	6.078E+10	6.507E+10	47.19	85.307816
2002	5629.6711	5.081E+11	1.401E+11	7.323E+10	7.831E+10	48.61	89.054691
2003	4321.0764	5.996E+11	1.793E+11	9.057E+10	9.485E+10	46.58	92.443968
2004	5777.8072	6.997E+11	2.559E+11	1.263E+11	1.39E+11	45.32	95.926518
2005	7621.7687	8.089E+11	3.124E+11	1.604E+11	1.833E+11	44.10	100
2006	20327.764	9.203E+11	3.657E+11	1.994E+11	2.294E+11	45.31	106.14554
2007	25349.892	1.201E+12	5.102E+11	2.523E+11	3.021E+11	41.35	112.90693
2008	47102.417	1.187E+12	4.538E+11	2.88E+11	3.501E+11	43.51	122.33678
2009	35633.939	1.324E+12	5.383E+11	2.729E+11	3.464E+11	48.41	135.64384
2010	27417.077	1.657E+12	6.739E+11	3.742E+11	4.489E+11	45.73	151.91058
2011	36190.456	1.823E+12	7.218E+11	4.474E+11	5.667E+11	46.67	165.36682
2012	24195.767	1.828E+12	7.009E+11	4.484E+11	5.713E+11	53.44	180.76599
2013	28199.446	1.857E+12	6.317E+11	4.722E+11	5.276E+11	58.60	200.48399
2014	34582.101	2.035E+12	7.036E+11	4.683E+11	5.292E+11	61.03	213.81414
2015	44064.129	2.09E+12	6.877E+11	4.168E+11	4.651E+11	64.15	224.3066
2016	44485.625	2.264E+12	6.876E+11	4.341E+11	4.671E+11	67.20	235.39

Sources: UNCTAD, World Bank (databank-world development indicator)& IMF.

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Appendix 2. The log of the variables:

log(FDI)	log(GDP)	log(GCF)	log(EX)	log(IM)	log(ER)	log(CPI)
1.875061	11.4257	10.81123	10.35936	10.3596	1.356837	1.597342
2.401401	11.45387	10.86338	10.40501	10.44051	1.413603	1.645736
2.725912	11.44023	10.83344	10.43751	10.43704	1.484204	1.672522
2.988559	11.50908	10.94935	10.50873	10.52207	1.496566	1.71475
3.33264	11.55081	11.00055	10.59054	10.63565	1.510908	1.757029
3.402261	11.58845	11.00995	10.6094	10.65563	1.54941	1.794364
3.558589	11.61312	11.06795	10.64667	10.69453	1.560066	1.824414
3.420451	11.61881	11.0498	10.66547	10.72678	1.615523	1.878379
3.336059	11.65581	11.12831	10.71923	10.78654	1.634028	1.898201
3.554851	11.66478	11.09678	10.78317	10.81272	1.652649	1.915274
3.738593	11.6803	11.11197	10.78378	10.81335	1.673817	1.930989
3.750483	11.70592	11.14657	10.86471	10.89384	1.686728	1.949657
3.635592	11.77786	11.25357	10.95698	10.97703	1.66823	1.965879
3.761763	11.8449	11.40809	11.1013	11.14296	1.656256	1.981939
3.882056	11.9079	11.49466	11.20509	11.26317	1.644438	2
4.30809	11.96394	11.56317	11.29968	11.36062	1.656165	2.025902
4.403976	12.07958	11.70773	11.40196	11.48014	1.61646	2.052721
4.673043	12.07443	11.65685	11.45946	11.5442	1.638541	2.087557
4.551864	12.12187	11.73099	11.43606	11.53953	1.684893	2.1324
4.438021	12.21922	11.82862	11.57315	11.65217	1.660161	2.181588
4.558594	12.2608	11.85839	11.65068	11.75333	1.669042	2.218448
4.383739	12.26189	11.84563	11.65167	11.75687	1.727844	2.257117
4.450241	12.26875	11.80052	11.67411	11.72227	1.767882	2.30208
4.538851	12.30865	11.84731	11.67055	11.72365	1.78554	2.330036
4.644085	12.32012	11.83737	11.61991	11.66754	1.80721	2.350842
4.64822	12.35484	11.83736	11.63761	11.66943	1.827339	2.371788