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A Study on Impact of Foreign Direct Investment on Gross Domestic Production in India

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ABSTRACT

The review of various literatures and renowned publications is emphasizing that the gross domestic production of a nation is determined by several factors such as growth in agriculture and manufacturing sector, export, inflation, exchange rate and international investment. In spite of different factors affecting the growth, the incremental growth of foreign direct investment in various sectors is considered to be a vital factor which controls all other factor. The 1991 new economic policy has unfolded red carpet to the international investors and reduced the uncertainty on the legal and regulatory frame work boosted the investors' confidence in the economy. As a result, the Indian economy witnessed a vigorous growth since the implementation of Liberalization, Privatization and Globalization (LPG). In this regard this paper is attempting to investigate the contribution of foreign direct investment to the gross domestic production of India. The investigation was made using a simple regression between foreign direct investment (FDI) and gross domestic production (GDP) for 23 years from 1991 – 2014. The result revealed that FDI has as positive impact on GDP.

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Introduction:

There are internal and external factors affecting and determining the economic growth of a nation. They are persistent slow growth, high inflation, exchange rate instability on account of capital outflows, fiscal and current account imbalances and lower investment. The 1991 economic reform made a robust structural reformation in international capital inflows such as foreign direct investment and foreign institutional investment. As a result a paradigm shift has occurred in Indian industrial sector both in manufacturing and service sectors.

Even after the financial crisis, the Indian economy witnessed a vigorous growth for two successive years. Since then it has decelerated, in 2013 the GDP growth was 4.5%. In 2014, it has marginally picked up to 4.7% due to increase in agriculture sector growth, net exports due to rupee depreciation, curbing gold imports. The overall growth was sluggish due to reduction of investment and private consumption expenditure. The GDP achieved a higher growth in the last 10 quarters with 5.7% in the first quarter of 2015. The growth was driven by improvement investment demand and exports. As well as rise in manufacturing and mining sector output. The reduction of uncertainty on the legal and regulatory frame work boosted the investors' confidence in the economy. The GDP in second quarter of 2015 recorded a mild slow down with 5.3%. It was driven by the community, social and personal services. The industrial sector underperformed in the second quarter. The foreign direct investment (FDI) is more significantly related to the GDP growth of the nation. The incremental growth of FDI is the good sign of economic growth. The financial system facilitates faster economic growth through pooling fund, encouraging and mobilizing overseas investments, risk diversification and liquidity management.

REVIEW OF LITERATURE

Said Jaouadi (2014), found that FDI has positive impacts on developing countries hosting such investments. Shiraz Khan (2014) investigated the *Impact of FDI on GDP*, from 1992 to 2010 of 59 countries representing the global economy, suggested that there is a significant positive relationship between all the variables of Production Function including Gross Domestic Product and Foreign Direct Investment Inflows. Anupam (2014), analyzed the Impact of FDI Outflows on GDP of Brics Countries, for a period of 2005-2013, and the result showed the FDI does not showing significant impact on GDP. Samuel and Xicangzhao (2013), investigated the impact of foreign direct investment and economic growth in Ghana from 1980 to 2010, and found that a long run equilibrium and casual relationship exists between the dependent variable. Misbah Nosheen (2013), found the existence of long run relationship between foreign direct investment and the gross domestic production in Pakistan during 1980-2010. Ali Riza Sandalcilar (2012), studied about the impact on Foreign Direct Investment and Gross Domestic Product. The causality test resulted a strong positive causality from FDI to GDP and a slightly less positive causality from GDP to FDI in ECO region. Thilakaweera (2012), studied Economic Impact of Foreign Direct Investment in Sri Lanka and showed that there is a long-run relationship between real per capita GDP, foreign direct investment (FDI). Sarbapriya Ray (2012), revealed the causal relationship between Foreign Direct Investment (FDI) and economic growth in India and confirmed causal relationship between foreign direct investment and

growth between 1991-2011. Agbo Joel Christopher (2012), investigated and found that FDI has the potential to positively impact upon the economy though its contribution to GDP was very low in Nigeria within the period under review. Dr.NajiaSaqib, Maryam Masnoon(2012), analysed the impact of FDI on economic growth of Pakistan, from 1981 to 2010, the findings were Pakistan's economic performance is negatively affected by foreign investment. Gaurav (2011), made a comparative Study of China and India to study the impact of FDI on GDP; for the period of 1993-2009, and found that 1% increase in FDI would result in 0.07% increase in GDP of China and 0.02% increase in GDP of India.SarumiAdewumi (2006) examined the contribution of foreign direct investment to economic growth in Africa and discovered that the contribution of FDI to growth is estimated to be positive in most of the countries but not significant. Hansen and Rand (2006) stated that FDI promotes economic growth developing Countries', but the extent to which a country is benefited by FDI depends on its trade policies, labor force skills and absorptive capabilities. Ahmad Zubaidi (2005), observed a positive contribution of FDI in the growth process of East Asian economies. From policy perspective, the evidence convincingly suggests that countries that are successful in attracting FDI can finance more investments and grow faster than those that deter FDI. Lyroudi Katerina (2004), studied the relationship between the foreign direct investment and Economic growth in transition economies from 1996 to 1998, and indicated that FDI does not exhibit any significant relationship with economic growth for the transition countries. SerhanCiftcioglu, and NerminBegovic (2003), investigated the nature of annual effects of changes in the ratio of Net Foreign Direct Investment (NFDIGDP) to GDP and employment in nine Central and East European countries for the period of 1995-2003. The study found that economic growth and unemployment rate are adversely affected by the increases in NFDIGDP whereas the relationship between Openness and NFDIGDP indicates positive correlation. Balasubramanyam, Salisu, (1996) examined Foreign direct investment and growth in EP and IS countries, and found that the beneficial effect of foreign direct investment, in terms of enhanced economic growth, is stronger in those countries.

Objectives of the Study

- To understand the impact of foreign direct investment on the gross domestic production in different nations through adequate review of literature.
- To estimate the cause and effect of foreign direct investment on gross domestic production in India during the study period using simple linear regression model addressing the ordinary least square assumptions such as serial correlation, heteroskedasticity and the normal distribution of residuals.
- To interpret the results of simple linear regression, Breush-Godfrey Serial Correlation LM Test, Heteroskedasticity:White Test and JarqueBera –Normality Test and draw a conclusion.

Testable Hypotheses

H_0 = The independent variable foreign direct investment is not significantly influencing the dependent variable gross domestic production.

H_a = The independent variable foreign direct investment is significantly influencing the dependent variable gross domestic production.

H_{01} = The data series is not suffering from heteroskedasticity.

H_{a1} = The data series is suffering from heteroskedasticity.

H_{02} = The residuals of the data series are normally distributed.

H_{a2} = The residuals of the data series are not normally distributed

H_{03} = The data series is not suffering from serial correlation

H_{a3} = The data series is suffering from serial correlation

Data & Methodology

In the present study the secondary data was used to analyze the impact of foreign direct investment on the gross domestic production in India during the study period 1991-92 to 2013 – 2014. The data has been retrieved from the Reserve Bank of India website. The analysis was performed by using software econometric views (E-Views .9). The hypotheses have been tested using simple linear regression addressing the issues of ordinary least square assumptions.

$$\gamma = \alpha + \beta\chi + \epsilon$$

Where γ the dependent variable gross domestic production (GDP) is, α is the intercept of γ . β is the slope coefficient and χ is the independent variable foreign direct investment (FDI). The error term is denoted as ϵ . The result of the regression analysis is presented below.

Results and Discussion

Coefficient of Determination - R^2	0.770957
P – Value of “F” Statistic	0.000000
P-Value of FDI Independent Variable	0.000000
P-Value of Obs*R- Squared : Breush-Godfrey Serial Correlation LM Test	0.000200
P- Value of Obs*R- Squared – Heteroskedasticity:White Test	0.080700
P- Value of JarqueBera –Normality Test	0.784651

The above results were obtained from data analysis. It shows that Coefficient of Determination - R^2 0.770957 which means the independent variable FDI is explaining the GDP growth in India by 77.09%. The p-value of F-Statistic is 0.0000 indicates the model is fit for the overall

population. It is ensured that the independent variable FDI is significantly influencing the dependent variable GDP with the p-value of 0.0000 smaller than 5%. Hence the null hypothesis H_0 is rejected. The p-values of Breush-Godfrey Serial Correlation LM Test, Heteroskedasticity:White Test and JarqueBera –Normality Test are 0.000200, 0.080700 and 0.784651 respectively. From the p-values, it is understood that the existence of heteroskedasticity is not found since the p-value of white test is larger than 5% and the null hypothesis H_{01} is accepted, the p-value of JarqueBera –Normality Test is larger than 5%, hence the null hypothesis is H_{02} accepted which means that the residuals are normally distributed. But the p –value of Breush-Godfrey Serial Correlation LM Test is smaller than 5% and the null hypothesis is H_{03} rejected, which means the data series is suffering from serial correlation.

Conclusion

The literature review has enumerated the predominant role of foreign direct investment in the growth of gross domestic production of the nations especially the developing nations. In this connection, the present study has empirically analyzed and found the existence of the linear relationship between the dependent and independent variables having addressed the issues of OLS assumptions except serial correlation. Though it an important issue, it is not creating a serious issue in cross section data where as it is the serious issue in time serious analysis. Hence, it is concluded that there is a positive relationship between foreign direct investment and gross domestic production in India during the study period.

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REGRESSION ANALYSIS – GDP vs FDI

Dependent Variable: Y_GDP

Method: Least Squares

Date: 05/29/15 Time: 11:00

Sample: 1 23

Included observations: 23

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	962.0519	15.90352	60.49301	0.0000
X_FDI	0.125220	0.014894	8.407476	0.0000
R-squared	0.770957	Mean dependent var	1050.261	
Adjusted R-squared	0.760050	S.D. dependent var	117.0137	
S.E. of regression	57.31882	Akaike info criterion	11.01808	
Sum squared resid	68994.40	Schwarz criterion	11.11682	
Log likelihood	-124.7079	Hannan-Quinn criter.	11.04291	
F-statistic	70.68566	Durbin-Watson stat	0.283066	
Prob(F-statistic)	0.000000			

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	31.55102	Prob. F(1,20)	0.0000
Obs*R-squared	14.07680	Prob. Chi-Square(1)	0.0002

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 05/29/15 Time: 11:16

Sample: 1 23

Included observations: 23

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.584869	10.18319	0.450239	0.6574
X_FDI	-0.006644	0.009579	-0.693543	0.4959
RESID(-1)	0.788405	0.140360	5.617029	0.0000
R-squared	0.612035	Mean dependent var	-4.32E-14	
Adjusted R-squared	0.573238	S.D. dependent var	56.00097	
S.E. of regression	36.58376	Akaike info criterion	10.15819	

Sum squared resid	26767.42	Schwarz criterion	10.30630
Log likelihood	-113.8192	Hannan-Quinn criter.	10.19544
F-statistic	15.77551	Durbin-Watson stat	1.479069
Prob(F-statistic)	0.000077		

Heteroskedasticity Test: White

F-statistic	2.801637	Prob. F(2,20)	0.0846
Obs*R-squared	5.033547	Prob. Chi-Square(2)	0.0807
Scaled explained SS	2.709401	Prob. Chi-Square(2)	0.2580

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 05/29/15 Time: 18:33

Sample: 1 23

Included observations: 23

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4656.442	1095.592	4.250160	0.0004
X_FDI^2	0.000928	0.002073	0.447832	0.6591
X_FDI	-3.854050	4.330780	-0.889921	0.3841

R-squared	0.218850	Mean dependent var	2999.757
Adjusted R-squared	0.140735	S.D. dependent var	3485.473
S.E. of regression	3230.913	Akaike info criterion	19.12002
Sum squared resid	2.09E+08	Schwarz criterion	19.26813
Log likelihood	-216.8803	Hannan-Quinn criter.	19.15727
F-statistic	2.801637	Durbin-Watson stat	0.464891
Prob(F-statistic)	0.084595		

Normal Distribution of Residuals

