JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

The Impact of FDI on Domestic Investment in India:A Sector-wise Analysis of Crowd-in and Crowd-out Effect

First Author: Deepa Palathingal
Ph. D Research Scholar
Department of Economics,
Central University of Tamil Nadu,
Thiruvarur – 610 101, Tamil Nadu
E-Mail ID: deepapalathingal@gmail.com
Mobile No.: 8940535675

Second Author: Dr. Syam Prasad
Assistant Professor,
Department of Economics,
Central University of Kerela,
Kasaragod, Kerela – 671 316
E-Mail ID: prasadnatural@gmail.com
Mobile No:9746545622

Third Author: Dr. P. Balamurugan
Assistant Professor,
Department of Economics,
Central University of Tamil Nadu,
Thiruvarur – 610 101, Tamil Nadu State
E-Mail ID: pbalamurugan@cutn.ac.in
Mobile No.: 9659718091

Abstract

An attempt has been made in this paper to examine the crowds-in and crowds-out effect of Foreign Direct Investment (FDI) in domestic capital formation in India. The model used in the study is based on the model developed by Agosin and Mayer in 2000. In the model, FDI has been included as an explanatory variable. The period of study is 21 years from 1990-91 to 2011-12. The coefficient of FDI is 'N 0.891419' shows that every N1 increase in FDI, domestic capital increase by 'N 0.891419'. Based on the results, it

would be possible to conclude that FDI, in terms of increasing domestic capital formation, produce a long term positive externalities in India. At the beginning of the 1990s India was strongly hit by transformation process. These policy changes are also influenced. India successful in taking advantage of these changes, because the inflows of FDI have a spillover effect and India taking advantage of the positive spillover effect of FDI and transferred it in to domestic capital formation.

Key Words: FDI, Domestic Capital Formation, crowd in, crowd out

Introduction

Foreign direct investment can play an imperative role in the development of a country. FDI carries technological advancement, employment opportunities and provides ample chances to the hosting countries to develop their economy. Under globalization, developing countries are paying much attention to attract FDI. Considering the positive and negative impact of FDI, enough attention has to be paid while allowing FDI. The attitude towards inward foreign direct investment has changed considerably over the last couple of decades, as most countries have liberalized their policies to attract FDI on the expectation that FDI would help them to attain higher economic growth rate. Many countries have relaxed their economic policies to remove entry barriers and opened up their economy to attract FDI.

Many empirical studies have proved that FDI has both positive and negative impact on the hosting countries' economy. The impact of FDI on domestic economy in terms of domestic investment, employment, GDP growth etc have been analyzed in many studies and found that impact is varying based on the economical and political condition of the hosting countries *(Misun and Tomsik 2002, Onaran et al 2013, Gladson 1986, Agosin & Machdo 2005)*. In India, most of the studies focused on the trend and pattern of FDI *(Rajput et al, 2012 & Chathurvedi, 2011)*. It is found that enough importance was not given in the earlier studies to analyze the impact of the FDI on the domestic capital formation in India. By realizing this research gap, an attempt has been made in this paper to study the impact of FDI in India's domestic capital formation.

Objectives

- To analyze the trend and pattern of FDI in India
- To analyze the crowd-in and crowd-out effect of FDI on gross domestic capital formation in India.

Methodology

The study is analytical in nature and covers a period of 21 years (1990-2011) to have a clear picture of the state of FDI in India. The study relay upon secondary data which is collected from Reserve Bank of India, Department of Industrial Policy and Promotion, Government of India, Central Statistical Organization and India Stat. The hypothesis of the study that impact of FDI on domestic investment, does it crowd in or crowd out domestic investment has been tested with various statistical tools, regression analysis etc. In order to examine the trend and pattern of FDI, the study uses percentages and growth rates. Granger causality test has been used to analyze the impact on the macroeconomic variables. For causality test, the variables need to be stationery and therefore all the variables have been made stationery by using Augmented Dickey Fuller test. For testing the crowd-out and crowd-in, ordinary least squire method is used.

FDI and Gross Domestic Capital Formation in India

The analysis of inflow of FDI and gross capital formation in India reveals that the ratio of FDI in gross capital formation is continuously increasing. A decade (1990-91-2000-01) after the liberalization, the inflow of FDI in India increased; nonetheless, it was not satisfactory. During this period, the proportion of FDI in gross capital formation ranged between 15 to 30 per cent. After the Competition Act 2002, the inflow of FDI in India has been increased drastically; because the abolition of formation of monopoly has increased the competition and it has encouraged the foreign investors. Hence, the ratio of FDI has increased more than 30 per cent. After the world depression 2008, investing countries are considering that India is a safe place for investment. Because unlike US, UK and Japan, the volatility in world exchange rate is not much affecting India. After 2008, India is attracting more FDI; it reflects the increasing ratio of FDI in gross capital formation in India (Table 1).

Sector-wise Trend of FDI Inflow in India

The composition of FDI has drastically changed during the reform period. During the pre-reform period, plantation and mining accounted for nearly 80 per cent of total FDI. In the post reform period, the bulk of FDI has been shifted to manufacturing sectors. The share of plantation and mining, which was 85 per cent of total FDI stock by the end of 1990, fell to 48 per cent by the end of 1997 *(Subash Sasidharan and Vinish Kathuria, 2008).* It is revealing to examine the share of the sectors that have attracted the largest inflow of FDI for the period 1991-2013. From the Table 2, the sector-wise analysis of FDI Inflow in India reveals that maximum of FDI has taken place in the service sector (18.75 per cent). The service sector is followed by the computer hardware and software in terms of FDI.

High volumes of FDI take place in telecommunication, real estate, construction, power, automobiles, etc. The rapid development of the telecommunication sector was due to the FDI inflows in the form of international players entering the market and transfer of advanced technologies. The telecom industry is one of the fastest growing industries in India. With a growth rate of 45 per cent, Indian telecom industry has the highest growth rate in the world.

FDI inflow to real estate sector has developed the sector. The increased flow of foreign direct investment in the real estate sector in India has helped in the growth, development, and expansion of the sector.

FDI inflow to construction activities (11 per cent) has led to a phenomenal growth. India has become one of the most prime destinations in terms of construction activities as well as real estate investment.

The FDI in automobile industry has experienced huge growth in the past few years; the increase in the demand for cars and other vehicles is powered by the increase in the levels of disposable income in India. The introduction of tailor made finance schemes, easy repayment schemes has also helped the growth of the automobile sector. Besides, India has a well-developed and competent Auto Ancillary Industry along with automobile testing and R & D centres. The automobile sector in India rank third in manufacturing three wheelers and second in manufacturing of two wheelers. After 2011, the inflow in automobile sector shows a decreasing tendency.

The increased FDI Inflows to Metallurgical Industries in India has helped to bring in the latest technology to the industries. Further the increased FDI Inflows to Metallurgical Industries in India has led to the development, expansion, and growth of the industries. All this has helped in improving the quality of the products of the metallurgical industries in India. The inflow in Metallurgical Industries is reveals that it is an attractive sector of foreign investors. During 2012 it receives 1466 million dollar inflow of FDI.

Based upon the data given by department of Industrial Policy and Promotion, in India there are sixty two (62) sectors in which FDI inflows are seen but it is found that top ten sectors attract almost seventy percent (70 per cent) of FDI inflows. The cumulative FDI inflows from the above results reveals that service sector in India attracts the maximum FDI inflows amounting to 38594.96 million dollar (2013), followed by Construction Development amounting to 22779.24 million dollar (2013), These two sectors collectively

attract around thirty percent (30 per cent) of the total FDI inflows in India. The Hotel & Tourism and Chemicals (Other Than Fertilizers) are among the new sectors attracting huge FDI inflows that come under top ten sectors attracting maximum FDI inflows *(Table 2)*. Thus the sector wise inflows of FDI in India shows a varying trend but acts as a channel for growth, quality maintenance and development of Indian Industries to a greater and larger extend. The technology transfer is also seen as one of the major change apart from increase in operational efficiency, managerial efficiency, employment opportunities and infrastructure development.

The Country-wise Inflow of FDI in India

The analysis of country wise inflows of FDI in India indicates that during 2007-2010, the total amount of Rs 5,26,537 of FDI was received from 113 countries including NRI investment. India's 83 percentage of cumulative FDI is contributed by nine countries while remaining 17 per cent by rest of the world *(Chaturvedi, 2011)*.

During 2006-07 to 2012-13, Mauritius emerged as the most dominant source of FDI contributing 38 per cent of the total investment in the country. Singapore is the second dominant source of FDI inflows with 10 per cent of the total inflows. DTAA (Double Taxation Avoidance Agreement) between these two countries, which favors routing of investment through these countries. United States of America (USA) slipped to third position by contributing nine per cent of the total inflow. UK occupied fourth position with eight per cent followed by Cyprus with six per cent, Netherland with per cent, Japan with four per cent, Germany with three per cent, UAE with two per cent, France with one per cent *(Table 3)*. The Economic Reforms in India has created conducive environment for the inflow of FDI in India. Besides, India is emerged as one of the favored destination for investment due to the low level of wages and wide demand-supply gap in financial services particularly in banking and insurance.

Model Specification

In order to estimate the impact of FDI on the Domestic investment in India, the study has taken into account the variables like GDP, Interest Rate, and Inflation which are closely related to the rate of investment. It is appropriate to check whether there is any feedback relationship of these macroeconomic variables with the investment.

$$gdcf = A+\beta_1 fdi+\beta_2 gdp-\beta_3 r-\beta_{4i}+u_i$$

Where,

gdcf = Gross domestic capital formation

fdi foreign direct investment

gdp gross domestic product

R interest rate

I rate of inflation

β = coefficient of independent variables

A = constant

U = Error term

Unit Root Test

A preliminary test for unit root is first carried out using the graphical method. The rationale is to check the properties of time series data. Graphical plots in Figure 1 suggest that the variables GDCF, GDP, FDI and Inflation seem to be trending upwards while, Interest rate does not show a clear trend as it fluctuates over time. All of the series seem to be exhibiting a time varying mean and variance suggesting that they are non- stationary in levels.

Figure 2 shows that all differenced variables fluctuate around the zero mean hence the variables are likely to be integrated of order one 1(1). This implies that the data is stationary if integrated of order one. The rationale is to avoid a spurious regression. However, one cannot precisely base conclusions on the graphical analysis because it is an informal test for stationarity. This entails the performance of formal unit root tests, in order to reinforce the findings from the graphical analysis. The Augmented Dickey- Fuller (ADF) was conducted to reinforce the graphical analysis findings. The result of the ADF is presented in Table 4, which shows all variable involved contain unit roots according to ADF test. The unit root tests using trend suggests that all series are non-stationary in level and becomes stationary after differencing.

Granger Causality Test

Granger Causality tests have been conducted with the help of the statistical software. Before conducting the Granger Causality test lag length was decided on the basis of correlogram. Granger causality test has been used to analyze the impact of FDI inflows on the domestic capital formation with other macroeconomic variables like interest rate, inflation, and GDP. The Granger-causality tests describe only short-run relationships. Before applying and interpreting the results of Granger causality, as general time Series

procedures do, the study first examines the stationary nature of all the variables (Table 4). It is evidenced from the unit root test that all variables are non-stationary. However, FDI, GDP and DGCF are stationary at their first difference. The series Interest rate and inflation is stationary at their second difference. The Granger-causality models are estimated after getting all the variables stationary. The result of the Granger causality test has been presented in Table 5. The result reveals that there is a bi-directional causality between DGDCF and FDI. This implies that the FDI flow into India has helped to raise the DGDCF, and vice versa. Result shows that there is a bi-directional causality between DFDI and capital formation. It implies that the FDI inflows into India have been successful in raising the upstream and downstream investment through its forward and backward linkages. There is positive growth rate of domestic capital formation for the period from 1990-2011. This positive growth of the GDCF can be attributed to the twin reason of the steady decline in the interest rate in the period. Interest rate has a negative growth rate from 1999 to 2011 and a high growth rate of FDI inflows. When interest rate goes down the investment is goes up and vice verse. When foreign firms exert spillover effects, the investment in the domestic firms goes up. The Granger causality tests also support this view that interest rate does Granger causes GDCF. These two variables have a bi-directional relationship between each other. This implies that the increase in the gross domestic capital formation is a result of sustained reduction in the interest rate and the spillover effect of the FDI inflows.

There is a striking relation between GDCF and GDP, The result shows that there is a bi-direction relationship between GDCF and GDP; this implies that domestic capital formation has helped to raise the level of growth in the economy; this may be because of the increase of the public investment and private investment during the study period. There is a uni-directional causal relation from gross domestic capital formation to inflation.

Testing for Crowd-in or Crowd-out

The main test conducted was about the long term crowd-in or crowd-out effect of FDI on domestic investment. The objective of the study is to find out the impact of foreign direct investment on domestic capital formation. The main variable is FDI, the coefficient of FDI is determining the crowd-in and crowd-out impact of domestic investment. To test this impact a single equation would be applied.

Gdcf = α1+ α 2 fdit-2+α 3it-2+α4rt-2+ui

Where:

Gdcf = gross domestic capital formation of India

Fdi = foreign direct investment

I = inflation

r= interest rate

ui=error term

α= coefficient of the determinants

() = all the variables, carry a subscript 't' for time, except as indicated for two period lag.

Here the main variable is that FDI, the coefficient of FDI is determining the crowd in and crowd out impact of domestic investment. Basically if:

α2> 1 = FDI has a stimulate or complementary effect on domestic investment

α2=1 = FDI increases domestic investment

0 <α2 <1 =FDI partially stimulates and partially supplement domestic investment

α2< 0= FDI has a displacement effect on domestic investment.

Here we skip the variable GDP because it includes high multicolinarity problem which make the regression result a spurious.

The regression result is shown in Table 6.

The coefficient of FDI is 'N 0.891419' shows that every N1 increase in FDI, domestic capital increase by 'N 0.891419'. The result shows that there is positive impact of FDI on domestic capital formation in India. . But the result is not statistically significant. The other explanatory variables interest rate and inflation are negatively affecting the domestic investment. Overall the model is not significant.

It is observed that all the variables do not have a good fit (R^2=0.666494) and the DW statistics provide evidence of auto-correlation (1.716255) at the 10 per cent level of significant, and other variables, interest and inflation were found be significant as indicated by their t ratios.

The difficulty involved is that, the FDI is highly waving mainly in the period of 2008-09, because of the depression. So the variability between domestic investment and foreign investment is high. It has minute effect in the overall significance. The another difficulty in finding long term coefficients of the effect of FDI on investment that are statistically different from one may be associated with large standard errors relative to their corresponding estimated coefficients, especially in the case of current and lagged FDI and 2-year lagged investment.

Based on the results, it would be possible to conclude that FDI, in terms of increasing domestic capital formation, produce a long term positive externalities in India. At the beginning of the 1990s India was strongly hit by transformation process. These policy changes are also influenced. India successful in taking advantage of these changes,

because the inflows of FDI have a spillover effect and India taking advantage of the positive spillover effect of FDI and transferred it in to domestic capital formation

Conclusion

From the analysis of the study, it can be concluded that the FDI inflows have positive impact on the Indian economy, and there is a scope for absorbing more FDI inflows. It found that there is a causal bi-directional relationship between FDI and Domestic Capital formation. The analysis of the study reveals that foreign direct investment has affirmative impact on domestic investment.

Table 1: Inflow of FDI and Gross Capital Formation in India

Year	FDI(In Billion Rs.)	Gross Capital Formation (In Billion Rs.)	Ratio
1990-91	42.47	3223.7	1.32
1991-92	18.36	3630.28	0.51
1992-93	77.23	3268.03	2.36
1993-94	166.86	3764.93	4.43
1994-95	305.82	3510.32	8.71
1995-96	719.51	4099.39	17.55
1996-97	896.37	4858.71	18.45
1997-98	1344.99	4428	30.37
1998-99	1107.72	5236.35	21.15
1999-00	939.45	5506.91	17.06
2000-01	1639.16	6716.71	24.4
2001-02	2612.37	6262.07	41.72
2002-03	2724.51	6950.12	39.2
2003-04	1985.62	7148.9	27.78
2004-05	2596.05	7987.15	32.5
2005-06	3374.44	10522.32	32.07
2006-07	9205.42	12237.17	75.23
2007-08	10201.05	14107.54	72.31
2008-09	21644.68	16534.38	130.91
2009-10	16907.48	16262.2	103.97
2010-11	9628.28	18320.51	52.55
2011-12	17343.49	21282.84	81.49

2012-13	13966.04	21594.17	64.68

Source: Compiled and calculated from the RBI data

Table 2: Sector-wise Foreign Direct Investment (FDI) Inflows in India (April 2000 to October 2013)

Sectors	Amount of FDI Inflow(In $)	Percentage Total FDI Inflow
Services Sector	38594.96	18.75
ConstructionDevelopment:Townships, Housing, Building infrastructure and construction- Development Projects	22779.24	11.06
Telecommunications	12888.58	6.26
Computer Software & Hardware	12178.83	5.92
Drugs & Pharmaceuticals	11399.98	5.54
Chemicals (Other Than Fertilizers)	9314.11	4.52
Automobile Industry	9079.19	4.41
Power	8154.59	3.96
Metallurgical Industries	7752.1	3.77
Hotel & Tourism	6800.15	3.3
Petroleum & Natural Gas	5483.34	2.66
Trading	4209.39	2.04
Food Processing Industries	3957.19	1.92
Information & Broadcasting (Including Print Media)	3638.22	1.77
Electrical Equipments	3273.16	1.59
Cement and Gypsum Products	2878.52	1.4
Non-Conventional Energy	2847.21	1.38
Industrial Machinery	2584.47	1.26
Miscellaneous Mechanical & Engineering Industries	2495.5	1.21
Construction (Infrastructure) Activities	2322.13	1.13
Consultancy Services	2233.86	1.09
Hospital & Diagnostic Centres	2073.1	1.01

Source: Ministry of Commerce & Industry, Govt. of India

Table 3: Country-wise Inflow of FDI in India

Country	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2000-13	% age total inflow
Mauritius	6363	11096	11208	10376	6987	9942	9497	73666	38%
Singapore	578	3073	3454	2379	1705	5257	2303	19460	10%
U.S.A	856	1089	1802	1943	2711	7874	1080	17549	9%
U.K	1878	1176	864	657	1562	2972	2237	14550	8%
Cyprus	644	695	883	899	1170	1115	557	11121	6%
Netherlands	58	834	1287	1623	1213	1405	1856	8965	5%
Japan	85	815	405	1183	913	1587	490	6889	4%
Germany	120	514	629	626	200	1622	860	5480	3%
U.A.E	260	258	257	629	734	663	646	3573	2%
France	117	145	467	303	341	353	180	2422	1%

Source: Ministry of Commerce & Industry, Govt. of India.

Table 4: The Augmented Dickey-Fuller Test Result

	Significant level	GDCF	FDI	GDP	INFLATION	INTEREST
Level	10%	-3.26142	-3.2614	-3.2614	-3.2614	-3.2689
	5%	-3.6449	-3.6449	-3.6449	-3.6449	-3.6584
	1%	-4.4678	-4.4678	-4.4678	-4.4678	-4.4983
	ADF -test statisti	0.8729	-2.3614	0.873	2.7640	-2.14127
First difference	10%	-3.2689	-3.2773	-3.2689	-3.2773	-3.26897
	5%	-3.6584	-3.6736	-3.6584	-3.67361	-3.65844
	1%	-4.4983	-4.532	-4.4983	-4.53259	-4.49830
	ADF -test statisti	-4.4285	-4.5046	-4.4285	-0.07240	-2.75682
Second difference	10%	-	-	-	-3.27736	-3.28690
	5%	-	-	-	-3.67361	-3.69081
	1%	-	-	-	-4.53259	-4.57155
	ADF -test statisti	-	-	-	-9.44731	-4.77184

Source: own table prepared based on the unit root result

Table 5: The Result of Granger Causality Test

Granger cause	*f-statistics*
DFDI does not Granger Cause DGDCF	*2.25401**
DGDCF does not Granger Cause DFDI	*2.53664**
DGDP does not Granger Cause DGDCF	*2.14973**

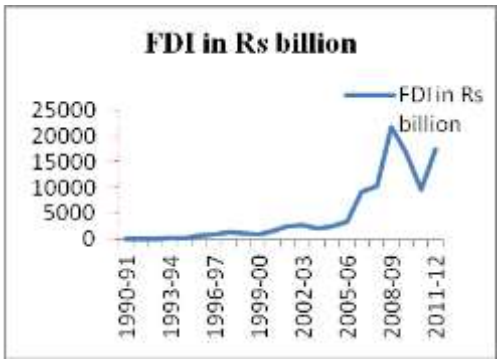
DGDCF does not Granger Cause DGDP	*2.15005**
DINFLATION does not Granger Cause DGDCF	*0.5425*
DGDCF does not Granger Cause DINFLATION	*8.38755**
DINTEREST does not Granger Cause DGDCF	*2.62206**
DGDCF does not Granger Cause DINTEREST	*1.34358*
DGDP does not Granger Cause DFDI	*2.53577**
DFDI does not Granger Cause DGDP	*2.25223**
DINFLATION does not Granger Cause DFDI	*0.31907*
DFDI does not Granger Cause DINFLATION	*8.42887**
DINTEREST does not Granger Cause DFDI	*3.0487**
DFDI does not Granger Cause DINTEREST	*2.17207**
DINFLATION does not Granger Cause DGDP	*0.54236*
DGDP does not Granger Cause DINFLATION	*8.39505**

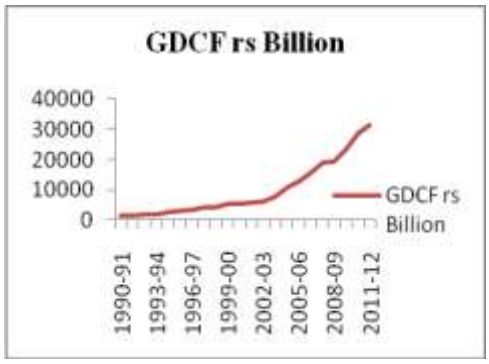
- indicating the significance

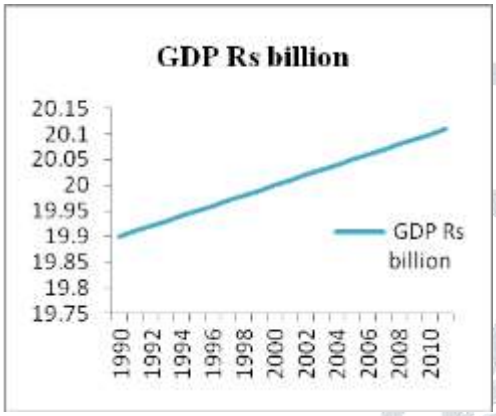
Table 6: The Regression Result

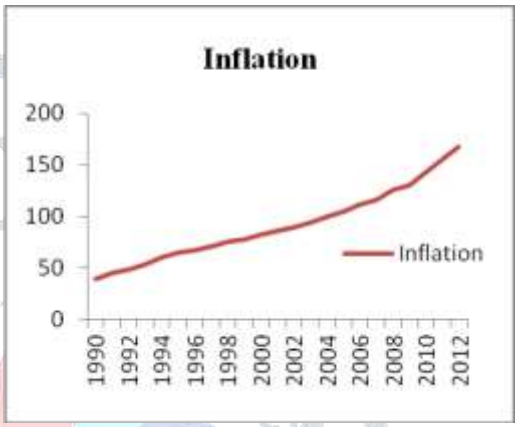
Gdcf	Coef	T	p> t
Fdi	0.891419	1.82	0.086
Inflation	-144.0139	6.23	0
Interest	-74.729	1.1	0.25

Figure 1 Plots of Variables at Level (1990-2011)









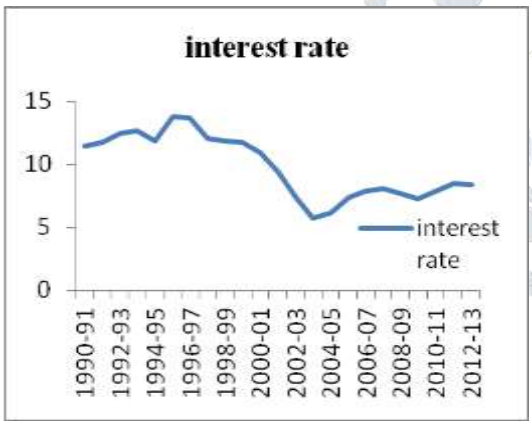
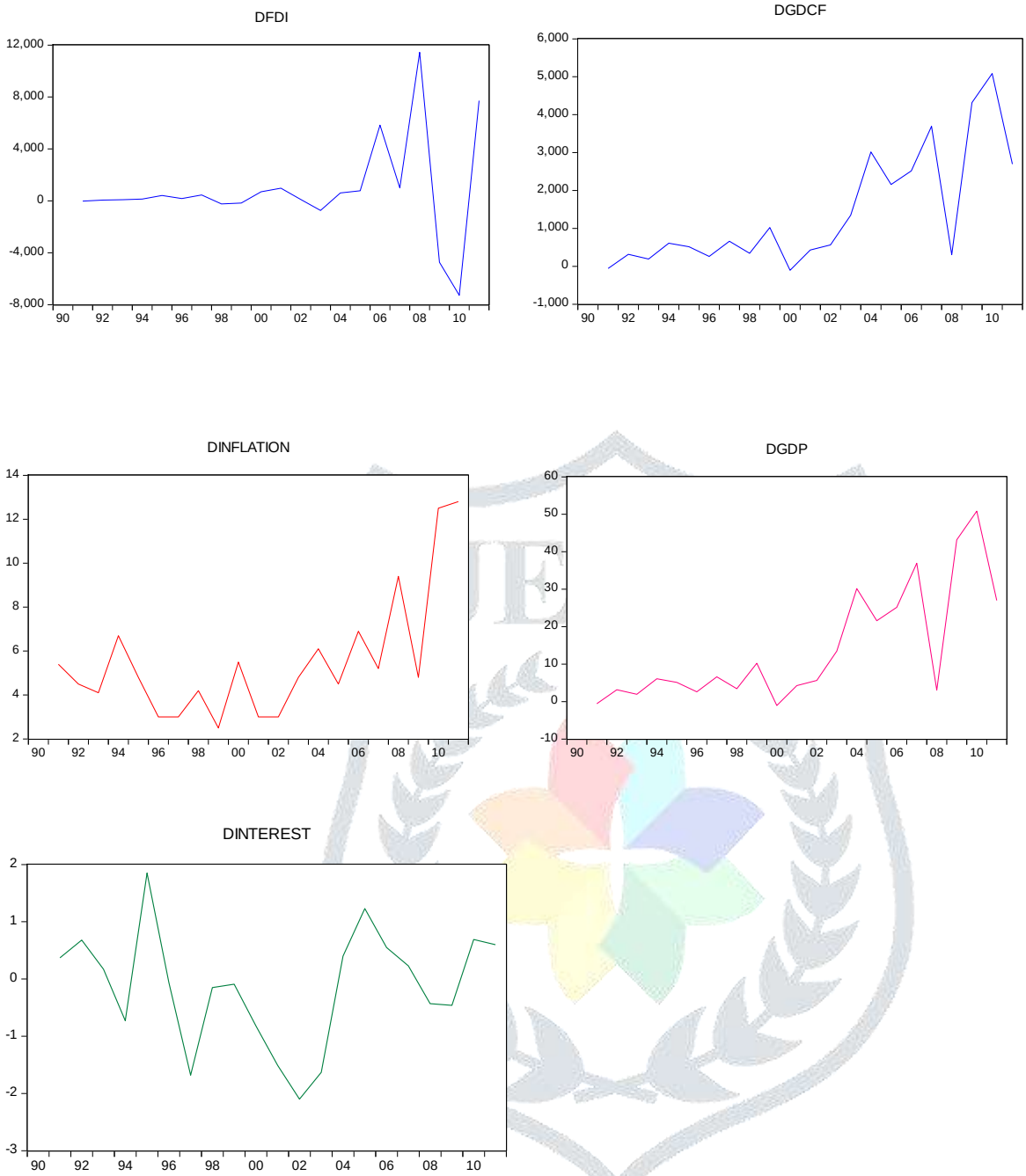


Figure 2 Plots of First Differenced Variables (1990-2011)



References

Manuel R. Agosin & Ricardo Mayer (2000), 'Foreign Investment in Developing Countries: Does it Crowd-in Domestic Investment?' ***United Nations Conference on Trade and Development (UNCTAD, Geneva***

Jan Misun & Vladimir Tomsik (2002), 'Does Foreign Direct Investment Crowd in or Crowd out Domestic Investment', ***Eastern European Economics, Vol. 40, No 2, pp. 38-56***

Zlem Onaran et al (2013), 'FDI and domestic investmet in Germany: crowding in or out', ***Discussion Paper, No 143, Department of Economics and Statistics, Middlesex University Business School, London***

Gladson I. Nwanna (1986), 'The Impact of Foreign Direct Investment on Domestic Capital Formation in a Developing Country: Nigeria', ***Savings and Development, Vol. 10, No 3, pp. 265-278***

Manuel R.Agosin & Roberto Machado (2005), 'Foriegn investment in developing countries: Does it Crowd in Domestic Investemnt', ***Oxford Development Studies.***

Rajput et al (2012), 'Trends and Patterns of Flow of FDI in Developed Countries and Developing Countries: A Comparison', ***International Journal of Social Science & Interdisciplinary Research, Vol. 1, No 9***.

Ila Chaturvedi (2011), 'Role of FDI in Economic Development of India: Sectoral Analysis', ***International Conference on Technology and Business Management.***

Subash Sasidharan & Vinish Kathuria (2008), 'Foreign Direct Investment and R & D: Substitutes or Complements—A Case of Indian Manufacturing after 1991 Reforms', ***Working Paper 04, United Nations Industrial Development Organization***