Causal Nexus Between Foreign Direct Investment And Economic Growth In India

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SECTION-I
INTRODUCTION

Foreign Direct Investment (FDI) is widely viewed as an important catalyst for the economic transformation of the transition economies. The most widespread belief among researchers and policy makers is that FDI boosts growth through different channels. They increase the capital stock and employment, stimulate technological change through technological diffusion and generate technological spillovers for local firms. As it eases the transfer of technology, foreign investment is expected to increase and improve the existing stock of knowledge in the recipient economy through labour training, skill acquisition and diffusion. It contributes to introduce new management practices and a more efficient organisation of the production process, which in turn improves the productivity of host countries and thus stimulates economic growth.

The advent of endogenous growth models (Romer, 1986, 1987; Lucas, 1988, 1990; and Mankiw, 1992) considered prove that FDI contributes significantly to human capital such as managerial skills and research and development (R&D). Multinational Corporations (MNCs) can have a positive impact on human capital in host countries through the training courses they provide to their subsidiaries' local workers. The training courses influence most levels of employees, from those with simple skills to those who posses advanced technical and managerial skills. Research and development activities financed by MNCs also contribute to human capital in host countries and thus enable these economies to grow in the long term (Blomstrom and Kokko 1998; Balasubramanyam et al. 1996).By and large, there is a direct relationship between inward foreign direct investment in relation to their size and economic development of a country. One of the strongest statements in that connection was made by Paul Romer (1993) who suggested that for a developing country that wishes to gain on the developed countries, or at least keep up with their growth, "……..one of the most important and easily implemented policies to give foreign firms an incentive to close the idea gap, to let them make a profit from doing so…….. The government of a poor country can, therefore, help its residents by creating an economic environment that offers an adequate reward to multinational corporations when they bring ideas from the rest of the world and put them to use with domestic resources".

On the other hand, the FDI can exert a negative impact on economic growth of the recipient countries. The dependency school theory argues that foreign investment from developed countries is harmful to the long-term economic growth of developing nations. It asserts that First World nations became wealthy by extracting labour and other resources from the Third World nations. It is also argued that developing countries are inadequately compensated for their natural resources and are thereby sentenced to conditions of continuing poverty. This kind of capitalism based on the global division of labour causes distortion, hinders growth, and increases income inequality in developing countries (Stoneman, 1975; Bornschier, 1980 and O'hearn, 1990). Further, the neo-classical growth models of Solow (1956) typically ascribe negligible long-run growth effects for FDI inflows and, with its usual assumption of diminishing returns to physical capital, these inflows can only have short-run impact on the level of income; leaving long-run growth unchanged. Moreover, FDI flows may have a negative effect on the growth prospects of a country if they give rise to substantial reverse flows in the form of remittances of profits and dividends and/or if the MNCs obtain substantial tax or other concessions from the host country. These negative effects would be further compounded if the expected positive spillover effects from the transfer of technology are minimized or eliminated altogether, because the technology transferred is inappropriate for the host country's factor proportions (e.g., too capital intensive); or, when this is not the case, as a result of overly restrictive intellectual property rights and/or prohibitive royalty payments and leasing fees charged by the MNCs

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for the use of the "intangibles" (see Ramirez, 2000 and Ram and Zhang, 2002).

From the above theoretical arguments, it appears that the debate of whether FDI inflows are growth-enhancing or growth-retarding in the emerging economies remains largely an empirical question. The present paper examines the earlier literature pertaining to the study areas which will be immensely useful to identify the gaps of the study. Early studies on FDI, such as Singer (1950), Prebisch (1968), Griffin (1970) and Weisskof (1972) supported the traditional view that the target countries of FDI receive very few benefits because most benefits are transferred to the multinational company's country. Bacha (1974) examined the effects of FDI by U.S. companies on the host country's growth. Their results revealed a negative relationship between these two variables, while Saltz (1992) examined the effect of FDI on economic growth for 68 developing countries, and he also found a negative correlation between FDI and growth. Similarly, Haddad and Harrison (1993) and Mansfield and Romeo (1980) found no positive effect of FDI on the rate of economic growth in developing countries. As De Mello (1999) points out: "whether FDI can be deemed to be a catalyst for output growth, capital accumulation, and technological progress seems to be a less controversial hypothesis in theory than in practice" (1999, p. 148). In his study, De Mello (1999) used both time series and panel data from a sample of 32 developed and developing countries and found weak indications of the causal relationship between foreign direct investment and economic growth. Carkovic and Levine (2002) used panel data from 72 developed and developing countries and performed both a cross section Ordinary Least Square and the Generalised Method of Moments (GMM) analysis and found that there is no robust link of a foreign direct relationship to economic growth. Moreover, the recent study by Bende-Nabende et al. (2003) found that FDI in some countries had a negative relation with economic growth. Mencinger (2003) had investigated the impact of FDI on growth in 8 transition countries for the years 1994-2001 and found that FDI has a robust negative effect on growth. Relatively similar results were obtained by Eric Fosu and Joseph Magnus (2006), who investigated the causal relationship between foreign direct investment and economic growth in Ghana.

On the other hand, the empirical literature supports the modernisation view that foreign direct investment can exert a positive impact on economic growth in emerging economies. Using a single equation estimation technique with annual data over the period 1960-1985 for 78 developing countries, Blomstrom, Lipsey and Zejan (1992) showed a positive influence of FDI inflows on economic growth. In an empirical study by Borensztein et al. (1998), an endogenous growth model was developed that measures the influence of the technological diffusion of FDI on economic growth in 69 developing countries over two periods, 1970-1979 and 1980-1989. They found that FDI inflows positively influenced economic growth. Moreover, the relationship between FDI and domestic investment in these countries was complementary. Campos and Kinoshita (2002) examined the effects of FDI on growth for 25 Central and Eastern European and former Soviet Union economies. Their results indicated that FDI had a significant positive effect on the economic growth of each selected country. Relatively similar results were obtained by De Gregorio (1992) for the case of Latin American economies. By using panel data for 18 countries in Latin America over the period 1970-1999, Bengoa and Sanchez-Robles (2003) pointed out that the impact of FDI on economic growth was positive only when host countries had adequate human capital, economic stability, and liberalized markets. Similarly, using a sample of 84 countries, Wang and Wong (2004) indicated that FDI promotes economic growth only when host countries have an adequate level of human capital. Besides, Alfaro et al. (2004), using cross country data for the period 1975-1995, showed that FDI played an important role in contributing to economic growth, and that countries with well-developed financial markets gained significantly from FDI, suggesting that countries with better financial systems can exploit FDI more efficiently. As a result, FDI can contribute more to economic growth in these countries. This finding was supported by Aghion et al. (2006) who used a sample of 118 countries over the period from 1960 to 2000. Moreover, Lensink and Morrissey (2006) had investigated the impact of FDI on growth in 87 countries for the years 1975-1997 and found that FDI has a positive effect on growth. Also, the study of Feridun and Sissoko (2006) for Singapore reveals that there is unidirectional granger causation from foreign direct investment to economic growth.

Some empirical studies indicate that higher economic growth will lead to greater FDI inflows into host countries. Jackson and Markowski (1995) had found that economic growth has had a positive impact on FDI inflows in some Asian countries. The studies of Kasibhatla and Sawhney (1996) and Rodrik (1999) for United States have found a unidirectional causal relationship from economic growth to foreign direct investment.

Besides, Tsai (1994) employed a simultaneous system of equations to test two-way linkages between FDI and

economic growth for 62 countries in the period 1975-1978, and for 51 countries in the period 1983-1986. He found that two-way linkages existed between FDI and growth in the 1980s. Bende-Nabende et al. (2001) also investigated the impact of FDI on economic growth of the ASEAN-5 economies over the period 1970-1996 and found that there exists a bi-directional relationship between the two variables. Similarly, Xiaohui et al. (2002) use quarterly data for China from 1981 to 1997 and find cointegration as well as bi-directional short-run and long-run causality between FDI and GDP. By using panel data for 23 developing countries for the period 1978-1996, Basu et al. (2003) pointed out two-way linkages between GDP and FDI. Furthermore, Saha (2005) estimated a simultaneous system of two equations to test the relationship between FDI and economic growth for an unbalanced panel dataset of 20 countries in Latin America and the Caribbean for the period 1990-2001 and found that FDI and economic growth were important determinants of each other in these countries. More recently, Mahmoud Al-Iriani et al (2007) investigated the causal nexus between foreign direct investment and economic growth in six Gulf Cooperation Countries (GCC) for the years 1970-2004. They found the bi-directional causality between foreign direct investment and gross domestic product.

At the national level, Chakraborty and Basu (2002) employed vector error correction model (VECM) to find the short run dynamics of FDI and growth for the years 1974-1996. The empirical result reveals that the causality runs more from real GDP to FDI flows. On the other hand, Alam (2000) in his comparative study of FDI and economic growth for Indian and Bangladesh economy stressed that though the impact of FDI on growth is more in case of Indian economy, yet it is not satisfactory. The study of Pradhan (2002) estimates a Cobb-Douglas production function with FDI stocks as an additional input variable for the years 1969-1997 and found that the FDI stocks have no significant impact for the whole sample period. Similarly, Bhat et al. (2004) provide no evidence of causality in either direction.

From the above existing literatures, it appears that the available evidence pertaining to causal nexus between foreign direct investment and economic growth in emerging economies seemed to be ambiguous and mixed at best. They are related to different countries and consequently, economics with different macro-economic fundamentals. Further, they are drawn at different time periods and employ different models with different assumptions in each case. Most of the studies employed Cointegration test and Vector Error Correction Model (VECM) to investigate the impact of foreign direct investment on growth. The advantage of Vector Error Correction Model is that it determines whether the system under consideration is in equilibrium or disequilibrium. Engle and Granger (1987) suggested that error correction models can determine if a part of the disequilibrium from one estimation period is corrected in the following period. Consequently, finding the evidence of the disequilibrium within the vector error correction testing framework, it provides an important indication of the direction and size of the short-run causality relationship between the foreign direct investment and economic growth. Hence, the present study employed similar techniques to investigate the causal nexus between foreign direct investment and economic growth with special reference to India. This may provide us with more robust conclusions regarding policy guidelines for the nation. If the FDI leads to growth, then the study recommends that liberalised FDI-oriented policy efforts should be taken to attract larger FDI flows into the country. On the other hand, if growth leads to FDI, then the restrictive policy efforts on FDI flows should be adopted and much attention would have to be paid towards the countries' growth performance. However, it should be noted that the prevailing studies regarding the policy implications pertaining to FDI-growth relationship for a developing economy like India are limited.

From the above context, it is worthwhile to identify the causal nexus between foreign direct investment and economic growth in India. The rest of the paper is organized as follows: Section-2 presents the methodology of the study. Section-3 offers empirical results and discussion. Finally, concluding remarks are presented in Section-4.

SECTION-II
METHODOLOGY AND DATA

Johansen's (1988) Cointegration and Vector Error Correction Model (VECM) was employed to examine the causal nexus between foreign direct investment and economic growth in India for the post-liberalization period. Augmented Dickey-Fuller (1979), Phillips-Perron (1988) and Dickey-Fuller Generalized Least Squares (1996) tests were employed to verify the stationarity of the data series. Further, the necessary lag length of the data series

was selected on the basis of Schwarz Information Criterion (SC). Johansen's Cointegration test is employed to examine the long-run relationship among the variables after they are integrated in an identical order.

Once identifying a single cointegration vector between foreign direct investment and growth, the Vector Error Correction Mechanism (VECM) was employed to examine the long-run relationship between the two, and it is presented below:

$$\Delta \mathbf{lnFDI}_t = \mathbf{c}_1 + \sum_{k=1}^{n} \alpha_{1i} \Delta \mathbf{lnFDI}_{t-k} + \sum_{k=1}^{n} \beta_{2i} \Delta \mathbf{lnIIP}_{t-k} + \rho_1 \mathbf{ECT}_{t-k} + \mathbf{u}_{1t} \quad \text{.....(1)}$$

$$\Delta \mathbf{lnIIP}_t = \mathbf{c}_2 + \sum_{k=1}^{n} \beta_{1i} \Delta \mathbf{lnIIP}_{t-k} + \sum_{k=1}^{n} \alpha_{2i} \Delta \mathbf{lnFDI}_{t-k} + \rho_2 \mathbf{ECT}_{t-k} + \mathbf{u}_{2t} \quad \text{.....(2)}$$

Where, Δ is the first difference operator and u_{1t} and u_{2t} are white noise disturbance terms. FDI_t and IIP_t are foreign direct investment and index of industrial production at the time t and ECT_{t-k} is the lagged error correction term.

The time series database on Foreign Direct Investment inflows and Index of Industrial Production were on a quarterly basis, and it covers the period from 1994-95:Q2 to 2008-09:Q1. The necessary information on foreign direct investment inflows was collected from the various issues of Handbook of Indian Economy, Reserve Bank of India (RBI) Bulletin. According to the definition of RBI, the FDI inflows in the Indian economy include equity capital, reinvestment of earnings, and other long term and short-term capital. Besides, the Index of Industrial Production (Base 1993-1994) is considered as a proxy for economic growth[1]. Data has been collected from various issues of Handbook of Indian Economy, Reserve Bank of India Bulletin and from the Central Statistical Organisation.

SECTION-III
EMPIRICAL RESULTS AND DISCUSSIONS

Table-1 presents the trend of absolute Foreign Direct Investment flows in India for the years 1991-92 to 2006-07. It reveals that the foreign direct investment flows in India were only Rs. 329 crores in 1990-91 and it went up to Rs. 13193 crores in 1997-98. But during 1999-2000, the foreign direct investment flows declined to Rs. 9396 crores and then, it went up in the proceeding years and reached the peak level of Rs. 99261 crores in 2006-07.

Table -1: Trend of Foreign Direct Investment Flows in India

(Rs.Crores)

Year	Foreign Direct Investment
1991-91	329
1992-93	959
1993-94	1837
1994-95	4216
1995-96	7216
1996-97	10093
1997-98	13193
1998-99	10388
1999-2000	9396
2000-01	18404
2001-02	29245
2002-03	24397
2003-04	19830
2004-05	26947
2005-06	39457
2006-07	99261

Source: Handbook of Indian Economy, RBI.

Besides, the analysis of percentage of foreign direct investment to gross domestic product and exports was examined, which will provide a better comparison of foreign direct investment in relative terms for India, and its results are presented in Table-2. It reveals that foreign direct investment as a percentage of gross domestic product

[1]This proxy for GDP is used in previous studies with reference to India such as Dua and Rashid (1998) and Bhat et al. (2004). This is due to the fact that National income database were not available on a quarterly basis.

was only 0.05 percent in 1991-92, and it went up to 0.86 percent in 1997-98. But during 1999-2000, it declined to 0.48 percent and later went up to 2.40 percent in 2006-07. Similarly, the foreign direct investment as a percentage of exports follows the same trend and meagerly increased from 0.74 percent in 1991-92 to 17.36 percent in 2006-07. However, the percentage of foreign direct investment to gross domestic product and exports are extremely smaller and thus, it is not plausible to support that foreign direct investment plays a significant role in determining economic growth in India.

Table -2: Foreign Direct Investment and Balance of Payment Indicators

Year	FDI/GDP	FDI/Export
1991-91	0.05	0.74
1992-93	0.12	1.78
1993-94	0.21	2.63
1994-95	0.41	5.09
1995-96	0.60	6.78
1996-97	0.73	8.49
1997-98	0.86	10.14
1998-99	0.59	7.43
1999-2000	0.48	5.88
2000-01	0.87	9.04
2001-02	1.28	14.0
2002-03	0.99	9.56
2003-04	0.71	6.75
2004-05	0.86	7.17
2005-06	1.10	8.64
2006-07	2.40	17.36

Source: Reserve Bank of India, various issues.

To empirically analyse the FDI-Growth relationship in India, the present study primarily tested the stationarity of the selected time series data for which univariate Dickey-Fuller Generalized Least Squares (DF-GLS), Augmented Dickey-Fuller (ADF) and Phillips-perron (PP) tests have been conducted and its results are presented in Table-3. The unit root tests results reveals that the foreign direct investment and index of industrial production series are found to be stationary at first order level and integrated at the order of I (1). Johansen's Cointegration test is performed to examine the long-run relationship between foreign direct investment and index of industrial production and its results are presented in Table-4.The table result reveals that presence of one cointegrating vector between the two variables. The Johansen's λ_{max} and λ_{trace} statistics indicate the foreign direct investment and index of industrial production stand in a long-run relationship between them, thus justifying the use of a Vector Error Correction Model (VECM) for showing short-run dynamics.

Table-3: Unit Root Test Results

Dickey-Fuller Generalized Least Squares Test			Augmented Dickey-Fuller Test		Phillips-Perron Test		
Variables	Intercept	Intercept & trend	Intercept	Intercept & trend	Intercept	Intercept & trend	Decision
LnFDI	1.04	-3.02	-0.19	-2.96	-0.34	-2.82	-
LnIIP	1.07	-1.58	0.58	-1.40	-0.42	-0.36	-
ΔLnFDI	-10.19*	-10.36*	-10.25*	-10.20*	-10.65*	-10.68*	I(1)
ΔLnIIP	-2.13**	-7.92*	-3.05**	-3.13**	-10.96*	-12.19*	I(1)

Notes: * (**) – indicates significance at the one and five per cent level respectively. Optimal lag length is determined by the Schwarz Information Criterion (SC) and Newey-West Criterion for the Augmented Dickey-Fuller Test and Phillips-Perron Test respectively.

Table - 4: Johansen's Cointegration Test Results

H_0	H_1	Eigen value		95% CV	99% CV
			λ_{trace} test:		
r = 0	r ≥ 1	0.5382	45.841*	25.32	30.45
r ≤ 1	r ≥ 2	0.0733	4.116	12.25	16.26
			λ_{max} test:		
r = 0	r = 1	0.5382	41.726*	18.96	23.65
r = 1	r = 2	0.0733	4.116	12.25	16.26

Notes: r is the number of cointegrating vectors under the null hypothesis. Critical values are noted from Johansen and Juselius (1990), and * - denote the significance at one per cent level.

The results of VECM have been presented in Table-5. Besides, the Vector Error Correction Model is sensitive to

the selection of optimal lag length and the necessary lag length of foreign direct investment and index of industrial production series is determined by the Schwarz Information Criterion (SC), and it reveals optimal lag of three[2]. In the table result of VECM, it is clear that the estimate of ECM_{t-1} in equation (1) is statistically significant at one per cent level, which confirms the direction of causality runs interactively through the error-correction term from an index of industrial production to foreign direct investment in the long-run. Besides, the lagged coefficients of index of industrial production in equation (1) are found to be statistically significant at one and five per cent levels.This indicates that causality runs from the index of industrial production to foreign direct investment in the short-run. The VECM results reveal that the economic growth leads to foreign direct investment, both in the short-run and long-run in India.

Table - 5: Test Results of Vector Error Correction Model Pertaining to Causal Nexus between Foreign Direct Investment and Economic Growth

Sl. No.	Eq. (1) Dependent Variable: ΔFDI_t			Eq. (2) Dependent Variable: ΔIIP_t			Inference
	Explanatory Variables	Estimate	t-value	Explanatory Variables	Estimate	t-value	
1.	ΔFDI_{t-1}	0.355	0.957	ΔIIP_{t-1}	-0.988	-16.12*	-
2.	ΔFDI_{t-2}	0.204	0.727	ΔIIP_{t-2}	-0.987	-21.07*	-
3.	ΔFDI_{t-3}	0.101	0.622	ΔIIP_{t-3}	-0.970	-19.80*	-
4.	ΔIIP_{t-1}	-2.419	-3.147*	ΔFDI_{t-1}	0.001	0.011	-
5.	ΔIIP_{t-2}	-1.678	-2.855*	ΔFDI_{t-2}	0.010	0.464	*IIP → FDI*
6.	ΔIIP_{t-3}	-1.518	-2.470**	ΔFDI_{t-3}	0.022	1.437	-
7.	ECM_{t-1}	-1.716	-3.920*	ECM_{t-1}	0.001	0.051	-
8.	Constant	0.012	0.264	Constant	0.028	0.184	-
9.	Adj. R^2	0.638	-	Adj. R^2	0.943	-	-
10.	R^2	0.688	-	R^2	0.951		

Notes: Optimal lag length is determined by the Schwarz Information Criterion (SC), FDI and IIP are Foreign Direct Investment and Index of Industrial Production respectively, * and ** denote the significance at the one and five per cent level, respectively.

SECTION-IV
CONCLUDING REMARKS

This study examines the causal nexus between foreign direct investment and economic growth in India during the post-liberalisation period. Johansen's cointegration technique followed by the vector error correction model (VECM) was employed to examine the objective. The database on foreign direct investment inflows and index of industrial production were taken on a quarterly basis and covers the period from the period 1994-95:Q2 to 2008-09:Q1. The empirical results revealed that unidirectional causation is running from economic growth to foreign direct investment both in the short-run and long-run in India.

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[2] Results of Schwarz Information Criterion (SC) will be presented on request.

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