Understanding the Impact of Inward FDI and Economic Growth

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Abstract

With liberalization of trade and markets nations across globe are able to overcome capital scarcity with inflow of Foreign Direct Investment (FDI). FDI is an important factor in the globalization process as it provides opportunities and financial challenges around the world promotes stable and lasting economic links between countries through direct access to investors in home economies to production units of the host economies. Understanding the influence/impact of inward FDI on economic growth is a dynamic area to study for researchers, as the empirical evidence on impact of FDI inflow on and economic growth are mixed, which deserves fresh enquiry. Objective of this paper is to identify the long term equilibrium relationship among inward FDI and gross domestic product, which will help one to understand the impact of inward FDI on economic growth. Gross Domestic Product (GDP) is proxied for economic growth. This is an empirical research and the research design is longitudinal in nature. Results of this study indicate that there exist a long run cointegrating relationship between inward FDI and GDP, the two variables for the study period from 1970-2010. 1% change in GDP will raise FDI inflow by 4.37%. The adjustment coefficient of the Error Correction Term (ECT) is negative and statistically significant indicating positive adjustment effect, which ensures, that in case of any external shocks, the long term equilibrium can be reverted back, and will re-ensures equilibrium between FDI inflow and GDP.

***Keywords**: Foreign Direct Investment, Economic growth, Gross Domestic Product, Cointegration, Vector Error Correction*

Introduction

In the last two decades, Foreign Direct Investment (FDI) has emerged as one of the major source for globalization and a significant catalyst for economic growth, transferring technology and knowledge among participating countries. The liberalization of trade, easing of business barriers, advancement in technology, accompanied with growing internationalization of goods, services and ideas over the past two decades made the world economies a globalized one. Emergence of large domestic markets, availability of skilled labour accompanied with economical wages, high returns to investment, developing countries now have a significant impact on the global economy, particularly in the economics of the industrialized states. Deregulation of markets, technological innovations and cost effective communication tools have allowed investors to diversify further their participation in competitive markets overseas. FDI is a significant factor in globalization process as it intensifies and enhances the interaction between states, regions and firms. Currently, the growth of international production is driven by liberalization of FDI and its related trade policies oriented towards economic and technological forces. FDI provides opportunities as well as challenges across the world, promotes stable and long-lasting economic links between countries through direct access to investors in home economies to production units of the host economies (i.e. the countries in which they are resident). Within a proper policy framework, FDI assists host countries in developing local enterprises, promotes international trade through access to markets and contributes to the transfer of technology and know-how. In addition to its direct effects FDI creates an impact on the development of labour and financial markets, and influences many aspects of economic performance through its multiple spill-over effects.

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The role played by FDI in the growth process has been a burning topic of debate in several countries including India

The amount of FDI which India receives is increasing considerably with time, even though it is not consistent. Many factors play a significant role in influencing the amount of FDI which a nation receives. The impact study of FDI is a dynamic area for many researchers. The benefits which a nation receives through FDI can be studied by examining the impact, which FDI created upon the macro and micro structures of an economy. Among them, understanding the influence/impact of inward FDI on economic growth is a dynamic area to study for researchers in the faculty of international business. This research studies the methodology involved in examining the impact of inward FDI on economic growth. The large increase in the inward and outward flow of FDI across the globe in the past two decades provides a strong incentive for research on this phenomenon. The choice of research topic has been made in order to allow for the possibility of finding results that can provide knowledge about the impact of FDI that may help policy makers of both home and host country to take appropriate decisions

Review of Literature

During the last decades, the relationship between FDI and economic growth has been extensively discussed in literatures of international business, which ranges from an unreserved optimistic view to a systematic pessimism. Many researchers and policymakers believe that FDI boosts growth for host countries through different development channels. Regarding causality of FDI and economic growth, it is an ongoing, unsettled and highly debatable/debated issue. The cointegrating and causality of FDI and economic growth are heterogeneous across countries, and an application of different econometric methodologies creates variations in test results. Therefore, it is critical to understand these variations when examining the relationship and causality between FDI and economic growth.

De Mellow (1992) indicates that, though FDI boosts long run growth through technological up gradation and knowledge spillovers, the extent to which FDI is growth- enhancing depends on the degree of complementarities and substitution between FDI and domestic investment. Results of this research conducted in OECD and non OECD countries shows that, impact of FDI on growth depends inversely on the technological gap between the leaders and followers, although there is sufficient evidence available to prove that bulk of FDI occurs across technologically advanced economies. His study concluded that FDI had significantly positive effect on economic growth for countries with high income, facilitates transfer of advanced technologies and provides resources for training labour force to get new skills. De Gregorio (1992) studied and identified that technologies and knowledge which are not readily available to host country investors, are made available, as a result of FDI, and in this way FDI led to productivity growth throughout the economies. FDI facilitates to create expertise that the country does not possess, and foreign investors may get access to global markets. Through empirical studies he found that increasing aggregate investment by 1 percent point of GDP increased economic growth of Latin American countries by 0.1percent to 0.2 percent in a year, but increasing FDI increased growth by approximately 0.6 percent a year during the period 1950-1985, thus indicating that FDI is three times more efficient than domestic investment.

Borensztein et al (1998) examine the effects of FDI on economic growth at the cross country level using regression framework, taking data on FDI outflows from OECD countries as well as sixty-nine developing countries from 1970-1989. They found that FDI is an important vehicle for adopting new technologies, contributing relatively more to growth than domestic investment. In addition, they also found that FDI contributes to economic growth to countries when the labor force has attained certain level of educational standard. Boon (2001) investigates the causal relationship between FDI and economic growth for Malaysia. His findings indicate that bidirectional causality exists between FDI and

economic growth besides contributing to an increase in output. Choe (2003) examines the causality of FDI and gross domestic investment and economic growth by applying the panel VAR model. He argues that GDI rates and FDI play catalyst role for economic growth through capital accumulation, which is necessary for long run growth, he analyzes GDI rates and FDI inflows in terms of their relationship to economic growth, in his empirical study, and he tests Granger causality between FDI inflow and GDI rates and GDP growth. From a sample of 80 countries comprising high income OECD countries and developing countries for the period of 1971 to 1995, he concludes that overall causality of FDI and GDI is bi-directional.

Chowdhury &Mavrotas (2003) examines the causal relationship between FDI and economic growth for three developing countries, namely Chile, Malaysia and Thailand from 1969-2000. Their empirical findings suggest that GDP causes FDI in the case of Chile but FDI does not cause GDP. Anderson (2004) discusses the potential of FDI inflows to affect host country economic growth. He argues that FDI should have a positive effect on economic growth as a result of technology spillovers and physical capital inflows. Performing both cross-section and panel data analysis on a data set covering 90 countries during the period 1980-2002, the paper finds that FDI inflows enhance economic growth in developing economies but not in developed economies. Dritsaki et al (2004) investigates the relationship between Trade, FDI and economic growth in Greece over the period 1960-2002, they found the existence of cointegrating relationship among the three tested variables. Results of Granger causality test showed that there is a causal relationship between the examined variables. Hansan and Rand (2005) analyze the causal links between FDI and GDP in a sample of 31 developing countries in Asia, Latin America and Africa for the period of 1970-2000. They identified existence of strong causal link running from FDI to GDP. Their results point out that FDI promotes gross capital accumulation as well as that a higher ratio of FDI in gross capital formation creates a positive effect on GDP growth. Moreover, FDI has a lasting impact on GDP, while GDP has no long run impact on the FDI. In that sense FDI causes growth, and they also found long-run effects from FDI to GDP.

Li and Liu (2005) investigates whether FDI affects economic growth based on panel data of 84 countries from 1970-1999. They identified a significant endogenous relation between FDI and economic growth from mid-1980 onwards. Besides, FDI also promotes economic growth with its interaction with human capital in developing countries. Using partial adjustment and time series data for the period 1976 to 2004, Do (2005) examines the impact of FDI on Vietnamese economy. He found the existence of short run and long run relationship between FDI and gross domestic product. FDI is shown to have not only short run but also long run effect on GDP of Vietnam. Daniele and Marani (2007) analyze the underlying factors of FDI and concluded that FDI plays a positive role in enhancing the economic growth of MENA countries. Dash and Sharma (2007) found evidence that there is bi-directional causality between FDI and economic growth. Findings of the study of Adams (2009) are FDI in developing and Sub- Saharan African countries contributes to economic development by, augmenting domestic capital and enhancement of efficiency through transfer of new technology, marketing and managerial skills, innovation and best practices. Further, FDI has both benefits and costs and its impact is determined by the country specific conditions in general and the policy environment in particular in terms of the ability to diversify, the level of absorption capacity.

Jayachandran and Seilan (2010), suggest that there exist a long term cointegration and causality relation between FDI inflow, GDP and trade. Bhattacharya and Bhattacharya. S (2011) observed the existence of long-run relationship between GDP and FDI Inflows. Georgantopoulos and Tsamis (2011) suggest, the existence of long-run equilibrium relationship among FDI and gross domestic product, but, there is a one-way causality running from gross domestic product to FDI, indicating that foreign capital penetration Granger-causes economic growth in Greece. Zhang (2001), examined 11 countries of Asia

and South America and found no uniform pattern of direction with regard to FDI and economic growth. Carkovic and Levine (2002) found that FDI inflows do not exert an independent influence on economic growth, but, the authors indicates that, while sound economic policies may spur both growth and FDI, the results are inconsistent with the view the FDI exerts a positive impact on growth that is independent of other growth determinants. Salisu (2004) in his case study examined the impact of FDI on economic growth in Nigeria. The study concluded that the contribution of FDI to economic growth in Nigeria was very low even though FDI happened to be a significant factor influencing the level of economic growth in Nigeria. Kholdy and Sohrabian (2005) found no causal link between FDI and economic growth. Bilgic (2006) examines the possible causal relationship between FDI and Economic Growth in Turkey. The study found that there is neither a long run nor a short run effect of FDI on economic growth. Rao and Dhar (2011) found that FDI inflows do not exert an independent influence on economic growth for India.

The empirical evidence on the causal link between FDI and economic growth and FDI are mixed and unsettled which deserves fresh enquiry using different data sets.

Research Methodology

Cointegration between FDI Inflow and Economic Development is studied here**.** Long run equilibrium relationship among variables can be established by following cointegration. If two or more than two variables are integrated of the same order d where $d > 0$, there exists a stationary linear combinations of these variables, the variables are said to be cointegrated**.**

Steps in cointegration

- If the data is non stationary, it should be converted into stationary
- If the data has got unit roots, it should be removed
- Check for the order of integrity of variables. Variables must be integrated of the same order. If the variables are not integrated of the same order the data should be made first difference I (1) or second difference I (2) or I (3). Very rarely data are differenced more than twice. If the variables are integrated of the same order cointegration can be carried out
- If there is evidence of cointegration, use the residual to form the error correction term in the corresponding Error Correction Model (ECM)
- Add in a number of lags of both explanatory and dependent variables to the ECM

Johansen-Juselius Method of cointegration is studied in this research.
Vector Error Correction Model

An Error Correction Model (ECM) reinstates the existence of long run relationship. An error correction model is a statistical specification of economic dynamics through which the variables restore the equilibrium relationship whenever disequilibrium takes place. ECM captures both the short-term and the long-run dynamics of cointegrating variables. Error Correction Models are a category of multiple time series models that directly estimate the speed at which a dependent variable - Y - returns to equilibrium after a change in an independent variable - X. ECMs are useful for estimating both short term and long term effects of one time series on another.

Present study, therefore, tries to reexamine the role of FDI in promoting India's economic development for a relatively longer period of data, from 1970 to 2010. Natural log values of the variables are taken for analysis to overcome the problem of stationarity. Period of study is from 1970 to 2010. Variables examined are inward FDI and gross domestic product (GDP). In this study GDP is proxied for economic

growth as seen in many literatures. Secondary data is collected from Reserve Bank of India and UNCTAD.

Hypotheses

H_0: There is no cointegration between FDI inflow and GDP
H_1: There is cointegration between FDI inflow and GDP

Test for Stationarity and Unit Root- Augmented Dickey Fuller
When dealing with time series data many econometric issues can influence the variables. Most of the macro economic data are non-stationary which means they tend to exhibit a deterministic and/or stochastic trend. Therefore, it is recommended that a stationarity (unit root) test be carried out to test for the order of integration. A series is said to be stationary if the mean and variance are time-invariant. A non-stationary time series will have a time dependent mean. Therefore, a stochastic process that is said to be stationary simply implies that the mean [(E(Yt)] and the variance [Var (Yt)] of Y remain constant over time for all t, and the covariance [covar (Yt, Ys)] and hence the correlation between any two values of Y taken from different time periods depends on the difference apart in time between the two values for all t≠s. the data shows non stationarity property, and after making first difference , the data is made stationary, which makes the time series data useful for further analysis. Augmented Dickey Fuller Test (ADF) is used widely for testing stationarity and unit roots.

Table 1 Results of ADF Test

Variable	At Levels			At First Difference		
	None	Intercept	Trend & Intercept	None	Intercept	Trend & Intercept
FDII	0.8196	0.7717	0.0182	0.000	0.000	0.0015
GDP	1.000	1.000	0.8544	0.6269	0.000	0.000

After selecting the order of integrating, next step is to test for the existence of long run cointegrating equilibrium relationship among the variables. This step involves testing for the appropriate lag length of the system. In this model lag length has been taken as two as suggested by Akaike Information Criterion, Schwarz Information Criterion and Hannan-Quinn Information Criterion. This follows a Vector Error Correction Model in order to establish the dynamic short run equilibrium. Cointegration Trace Test and Maximum Eigen value test have been applied to check the cointegration relationship. Results of these tests have been reported in Table 22and in Table 23, which shows three cointegrating vectors.

Table 3 Results of Johansen Cointegration Test Results (Trace)

Hypothesized No of CE(s)	Eigen Value	Trace Statistics	5% Critical Value	Probability
None*	0.426	33.47	15.49	0.00
At most 1*	0.244	11.20	3.84	0.00

Table 4 Results of Johansen Cointegration Test Results (Maximum Eigen Value)

Hypothesized No of CE(s)	Eigen Value	Max Eigen Statistics	5% Critical Value	Probability
None*	0.42	22.27	14.26	0.00
At most 1*	0.24	11.20	3.84	0.00

The Johansen approach can determine the number of cointegrating vectors for any given number of non-stationary variables of the same order. The results reported in table 3 and 4, suggest that the null hypothesis of no cointegrating vectors can be rejected at the 1% level of significance. It can be seen from

the Trace Statics that we have two cointegration equations. In other words, there exist two linear combinations of the variables.
Results of Vector Error Correction Model between FDI inflow and GDP (VECM)

The coefficient of Error Correction Term gives information about whether the past values affect the current values of the variables studied. A significant coefficient implies that past equilibrium errors play a role in determining the current outcomes. The information obtained from the ECM is related to the speed of adjustment of the system towards long-run equilibrium. The short-run dynamics are captured through the individual coefficients of the difference terms. The adjustment coefficient on *EC* equation must be negative and statistically significant, which also supports the existence of long term relationship. When coefficient of ECT is negative, then the model is stable.

Table 5 Results of Estimated Cointegrating Relationship

Equation	Independent Variable	Impact on FDI
1	LGDP(-1)	4.370 (-10.93)

VECM has been applied to obtain the final results of the analysis which are reported in the Table No 5. The results of this analysis have also been represented in equation given as below:
$FDI=35.84+4.37+u_t$ (10.93)

The analysis shows that GDP is found to be statistically significant for India. Here X coefficients (elasticities) show the percentage change in FDI due to one percentage change in FDI. X coefficient of GDP is estimated to be 4.37 found to give positive and statistically significant impact indicating 1% change in GDP will raise FDI by 4.37%. Market size (GDP), faster economic growth and higher degree of economic development ensures better opportunities for the foreign investors to expand and exploit resources for getting economic advantages.

As per the analysis results, the Error-Correction Term is -0.851, which is statistically significant and has a negative sign, which confirms that there isn't any problem in the long-run equilibrium relation between the independent and dependent variables. If their relative price 0.851 (-4.15) denotes a satisfactory convergence rate to equilibrium point per period. Error Correction Coefficient of -0.851, suggests 85.1% movement back towards equilibrium following a shock to the model, one time period later.

Table 6 Results of Vector Error Correction Model for FDI Inflow and GDP

Error Correction:	Model 1	Model 2
CointEq1	-0.851665	0.000395
	(0.20495)	(0.00598)
	[-4.15558]	[0.06604]
D(LNFDI(-1))	0.328507	-0.004960
	(0.17619)	(0.00514)
	[1.86446]	[-0.96419]
D(LNFDI(-2))	0.055025	0.011870
	(0.15150)	(0.00442)
	[0.36319]	[2.68372]
D(LNGDP(-1))	1.291438	0.044604
	(4.96624)	(0.14498)
	[0.26004]	[0.30765]
D(LNGDP(-2))	-13.10415	0.272958
	(4.93981)	(0.14421)
	[-2.65276]	[1.89278]
C	0.743624	0.037772
	(0.38715)	(0.01130)
	[1.92076]	[3.34195]
R-squared	0.453884	0.311681
Adj. R-squared	0.371139	0.207391

Findings and Conclusion

The objective of this paper is to identify the impact of inward FDI on economic growth. The variables taken for studying Causality of FDI inflow are FDI inflow, Gross Domestic Product (GDP) proxied for economic growth. All the data are checked for stationarity and unit roots. Results of the Johansen Jesulius Cointegration Test between FDI inflow and GDP indicates that the null hypothesis of no cointegration have been rejected at 5% level of significance. As per the results of the trace test statistics and maximum eigen statistics value, more than one cointegrating equation between FDI inflow and GDP is ensured. Cointegration coefficient of GDP is estimated to be 4.37 which is positive and statistically significant impact. This indicates 1% change in GDP will raise FDI inflow by 4.37%. The adjustment coefficient of the Error Correction Term (ECT) is negative and statistically significant at 1 % level. This phenomenon indicates that the error correction term has an opposite adjustment effect, which ensures, that in case of any external shocks, the long term equilibrium can be reverted back, and will re-ensures equilibrium between FDI inflow and GDP. The value of the ECT 0.890 (-4.155) denotes a satisfactory convergence rate to equilibrium point per period. The cointegration and error correction test indicates that there exist a long term equilibrium relationship between FDI inflow and GDP. As there is a possibility of more than one cointegration equation the direction of causality is expected to move from FDI inflow to GDP and from GDP to FDI inflow. Results of the Johansen Jesulius Cointegration Test between FDI inflow and Exports indicates that the null hypothesis of no cointegration have been rejected at 1% level of significance. The results of this research study are consistent with the already existing research studies done in India by researchers like Jeyachandran and Seilan, Sarbapriya ray. This study adds to the existing literature on FDI inflow in India. As a strategic component of investment, India needs FDI for her sustained economic growth and development.

Reference

Bhattacharyya, B., & Palaha, S. (1996). Foreign Direct Investment in India: Facts and Issues, Occasional Paper 2,. New Delhi: Indian Institute of Foreign Trade.

Bilgic, E. (2006). Causal relationship between Foreign Direct Investment and Econmic Growth in Turkey, www.diva_portal.org\diva\get\docment. Retrieved from www.diva_portal.org\diva\get\docment: 1. Emrah Bilgic (2006), "Causal relationship between Foreign Direct Investment and Econmic Growth in Turkey", www.diva_portal.org\diva\get\docment

Boon, K. (2001). Foreign Direct Investment and Economic Growth. Retrieved from www.oocities.com/hjmohd99/theses.html

Borensztein, E., De Gregorio, J., & Lee, J. (1998). 3. Borensztein, E.,How does foreign direct investment affect economic growth? Journal of International Economics, Vol: 45, 115-135.

Carkovic, M., & Levine, R. (2002). Does Foreign Direct Investment Accelerate Economic Growth? Minnesota: University of Minnesota, Department of Finance, available at: www//ssrn.com/abstract=314924).

Chalapati Rao, K., & Biswajit, D. (2011). India's FDI Inflows: Trends and Concepts, http: //dx.doi.org/10.2139/ssrn.1770222. Retrieved from http: //dx.doi.org/10.2139/ssrn.1770222.: 2. K.S.Chalapati Rao and Biswajit Dhar (2011), "India's FDI Inflows: Trends and Concepts", http: //dx.doi.org/10.2139/ssrn.1770222.

Chowdhury, A., & Mavrotas, G. (2003). FDI and Growth: What Causes What? Sharing Global Prosperity. Helsinki: Wider.

Dash, R. K., & Sharma, C. (2007). FDI, Trade and Growth in India: A modified causality analysis. Journal of Indian School of Political Economy, Vol 19 (3) , 451-467.

De Gregorio, J. (1992). Economic Growth in Latin America. Journal of Development Economics, 39, 58-84.

De Mello, L. (1997). Foreign Direct Investment in Developing Countries and Growth: A Selective Survey. Journal of Development Studies, 34(1), 1-34.

Do, T. (2005). The impact of Foreign Direct Investment and Openness on Vietnamese economy. Retrieved from www.essays.se/essay/de881759c9: www.essays.se/essay/de881759c9

Dritsaki, M., Dritsaki, C., & Adamopoulos, A. (2004). A Causal Relationship between Trade, Foreign Direct Investment and Economic Growth in Greece. American Journal of Applied Sciences 1 (3) , 230-235.

Georgantopoulos, A. G., & Tsamis, A. D. (2011). The Causal Links between FDI and Economic Development: Evidence from Greece. European Journal of Social Sciences, Vol.27(1) , 12-20.

Henrik, H., & Rand, J. (2005). On the Caual links between FDI and garowth in developing countries. UNU-Wider: United Nations University.

Jeyachandran, G., & Seilan, A. (2010). A Causal Relationship between Trade, Foreign Direct Investment and Economic Growth for India. International Research Journal of Finance and Economics, 42 , 74-88.

Jong, C. (2003). Do Foreign Direct Investment and Gross Domestic Investment Promote Economic Growth? Review of Development Economics, Vol: 7, (1)., 44-57.

Kholdy, S., & Sohrabian, A. (2005). Financial Markets, FDI, and Economic Growth: Granger Causality Tests in Panel Data Model. Moscow : EFA 2005 Moscow Meetings.

Li, X., & Liu, X. (2005). 2Foreign Direct Investment and Economic Growth: An Increasingly Endogenous Relationship. World Development. Vol:33(3), 393-407.

Ray, S. (2012). Impact of Foreign Direct Investment on Economic Growth in India: A Cointegration Analysis. Advances in Information Technology and Management, 2(1), 187-201.

Salisu, A. A. (2004). The Determinants and Impact of Foreign Direct Investment on Economic Growth in Developing Countries: A study of Nigeria. Indian Journal of Economics, 333-342.

Vittorio, D., & Marani, U. (2007). Do institutions matter for FDI? A comparative analysis for MENA Countries. Retrieved from ideas.repec.org/p/pra/mprapa/2426.html: ideas.repec.org/p/pra/mprapa/2426.html

Zhang, K. H. (2001). "Does Foreign Direct Investment Promote Economic growth? Evidence from East Asia and Latin America. Contemporary Economic Policy, 19 (2), 175-185.