

FOREIGN DIRECT INVESTMENT- ECONOMIC GROWTH NEXUS: EVIDENCE FROM INDIA

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Abstract

Foreign direct investment inflows were steadily increasing in India since 1990s and the impact on the economic growth was more or less ambiguous. This paper attempts to examine the nexus between foreign direct investment and the economic growth in India during the period 1990-91 to 2014-15 (post reform period). From the results it was observed that, at the aggregate level, foreign direct investment does not have a positive effect on the economic growth in India. It was also found that economic growth was influenced by domestic investment and not by foreign direct investment in the post reform period.

Keywords: Foreign Direct Investment, Economic growth, Stationarity, Cointegration

JEL Classification: F21, F43, C32

1. Introduction

The past two decades saw the increasing presence of foreign direct investment (FDI) especially in the developing world. FDI inflows has numerous positive effects on the development process of the host country [Lipsey, (2000)]. FDI brings in the required capital, managerial inputs and the latest technology into the country. The importance of FDI becomes more pronounced when it generates employment, enhances productivity and competitiveness in the industry. It promotes linkages with the local firms, which can be beneficial to the country. Due to these facts, the developing countries have formulated policies to encourage FDI inflows. As a result, these countries were successful in attracting substantial FDI. Most of them still continue to vigorously pursue policies aimed at encouraging even more FDI inflows.

The Indian economy is no less different. The post reform period, (since 1990s), saw India evolving from a relatively closed economy into an emerging market economy. The Liberalisation, Privatisation, Globalisation era which ensued opened its doors wide open to foreign trade and investment. With the economy opening up, there was substantial inflow of capital over the years. There has been a spurt in capital inflows into India, especially, FDI. There was a phenomenal growth of FDI over the years. This was made possible by the comprehensive reforms in the economic policies. The economic policies have been tailored to fit the new regime. This gush in FDI inflows, due to the liberalised regime, must have

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definitely spurred growth in India by providing a favourable environment. This may have led to changes in India's macroeconomic variables. The shortage of capital, technology, managerial skills and entrepreneurial capabilities experienced by the Indian economy till then, would have been offset by the FDI inflows.

However, the macroeconomic fundamentals became stronger over the years. The result was quite obvious, especially in terms of the growth of the Gross Domestic Product (GDP) that followed. The growth rate was seen cruising over 6 to 7 per cent per annum in the 1990s. Later on, the growth momentum strengthened even further and the growth rate hovered over 9 per cent per annum till 2008. Thereafter, the growth rates have been fluctuating. This achievement was probably due to the surging FDI inflows which was observed to be the most significant among the other inflows. The impact of FDI on economic growth was elusive. Many applied papers have examined the FDI - Economic growth nexus, but the results have been inconclusive. Mostly, all existing studies on the FDI- growth nexus have concentrated on the aggregate growth effects of FDI on economic growth. Despite the absence of any robust conclusions and in spite of the theoretical nuances and ambiguities, FDI inflows and studies on FDI- growth have continued over the recent decades. The role of FDI can be positive, negative or insignificant. In this paper, the FDI- growth nexus in the Indian context is being examined. An important question posed here is whether FDI has led to economic growth in India? This paper scrutinizes the FDI and economic growth relationship by studying the role of FDI inflows in promoting growth. The positive effects of FDI on the host economy might depend not only on local conditions and policies but also on the sector into which FDI flows.

A comprehensive review of the voluminous literature on FDI and growth is beyond the scope of this paper. However, recent empirical studies on the FDI inflows and economic growth linkages and some general findings are highlighted in section 2. Trends, model specification and the results are summarised in section 3. In the final section, the concluding remarks are presented.

2. Empirical Studies on the FDI-Growth Nexus

There are so many empirical studies based on this area. Most of them are widely cited. Reis (2001) investigated the effects of FDI on economic growth when investment returns were repatriated. It was observed that after opening up to the FDI, domestic firms were replaced by foreign firms in the R&D sector. Domestic welfare was likely to decrease because of the transfer of capital returns to the foreign firms. The model also explained that the effects of FDI on economic growth depended on the relative strength of the interest rate regimes. If the world interest rate was higher than the domestic interest rate, FDI had a negative effect on growth. Again, if the world interest rate was lower than the domestic interest rate, FDI had a positive effect on growth.

In contrast, Carkovic and Levine (2002) utilized both OLS and Generalised Method of Moments (GMM) to study the relationship between FDI inflows and economic growth. Both panel and cross- section data from 72 developing and developed countries for the period 1960 to 1995 were used. It was concluded that for both developed and developing countries, FDI inflows did not influence economic growth independently. Economic policies may stimulate economic growth and FDI.

Bengoa and Sanchez-Robles (2003) estimated the interaction between economic freedom, FDI and economic growth. Panel data for a sample of 18 Latin American countries over the period 1970 to 1999 was analysed. It was found that FDI had positive and significant impact on economic growth in the host countries. It was inferred that the host country required adequate human capital, economic stability and the liberalisation of capital flows to benefit in the long run.

Li and Liu (2005) investigated the endogenous relationship between FDI and economic growth. Panel data for 84 countries over the period from 1970 to 1999 was used. Both single equation and simultaneous equation system techniques were applied. FDI indirectly influenced growth through its interaction terms. In developing countries, it was found that there was a strong positive effect of FDI on economic growth through its interaction with human capital. However, the interaction of FDI with the technology gap had a significant negative impact.

Choe (2003) explored the interaction between FDI and economic growth in 80 countries during the period 1971 to 1995. Bi-directional causation between FDI and economic growth was detected and the stronger effects were more apparent from economic growth to FDI rather than from FDI to economic growth.

Some studies have highlighted the importance of spillover effects of FDI. Bende (2001) studied the impact of FDI through spillover effects on the economic growth of the Association of South Eastern Asian Nations (ASEAN) during the period 1970 to 1996. It was found that FDI influenced economic growth either directly or through spillover effects. The impact of FDI on economic growth was found positive and significant for Indonesia, Malaysia, and Philippines. A negative relationship was identified in Singapore and Thailand.

Similarly, Marwah and Tavakoli (2004) scrutinised the effect of FDI on economic growth in Indonesia, Malaysia, Philippines, and Thailand. Time series annual data for the period 1970 to 1998 was analysed. It was found that there was a positive correlation between FDI and economic growth in the above mentioned nations.

Helpman (2004) opined that the endogenous growth theory highlighted the possibilities of how investment influenced economic growth. It was through the impact on the range of available products and also the impact on the knowledge available for research and development activities.

Again, the impact of FDI on exports was not observed in the region. Dritsaki, Dritsaki and Adamopoulos (2004) investigated the relationship between Trade, Foreign Direct Investment (FDI) and economic growth in Greece over the period from 1960 to 2002. Cointegration analysis results suggested that there was a long-run equilibrium relationship between these variables. The Granger causality test results inferred that there was a bi-directional causal relationship between exports and economic growth. There was a uni-directional causal relationship between Foreign Direct Investment and economic growth with direction from FDI to GDP.

Kinoshita and Lu (2006) related FDI inflow and economic growth among a group of 42 emerging and developing countries. Panel data for the period 1970 to 2000 was analysed. It was observed that FDI alone failed to affect economic growth. It was significant in countries with sufficient infrastructure. It was concluded that FDI and infrastructure complemented each other in promoting GDP growth.

Iqbal, Shaikh and Shar (2010) examined the impact of FDI on economic growth and exports in Pakistan. The empirical analysis was carried out with quarterly data for the period from 1998 to 2009. A VAR model framework was used. It was however concluded that in Pakistan, there was a positive effect of FDI on economic growth and exports.

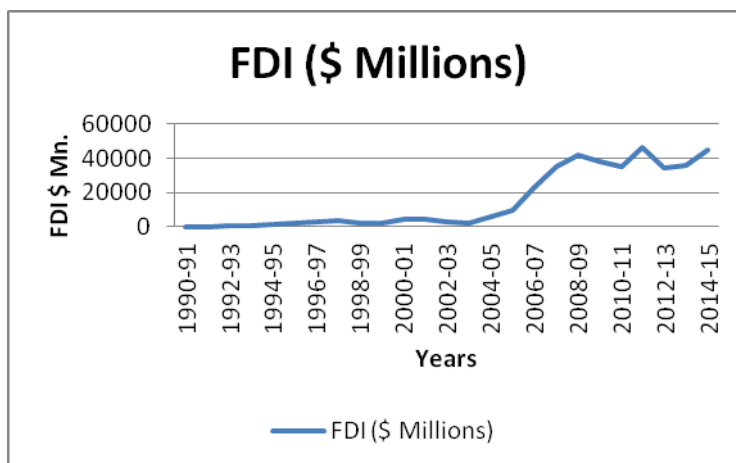
Szkorupová (2014) studied the causal relationship between foreign direct investment, economic growth and export in Slovakia. Quarterly data for the period from 2001 to 2010 were used. The co-integration method and vector error correction model were applied. The results confirmed the existence of long-term causal relation between the variables. There was a positive impact of both foreign direct investment and export on gross domestic product.

Fadhil and Almsafir (2015) analysed the role of FDI inflows in promoting economic growth in Malaysia. Annual data for the period 1975 to 2010 was used. An endogenous growth model was adopted. Unit root test and Johansen Cointegration test showed that the time series data was stable and the linear combination of the variables were stationary. Hierarchical Multiple Regression Analysis was also done. The results showed that the FDI inflows together with the human capital development contributed to the economic growth.

The role of FDI in the economic growth process of the host country has been a debatable issue in the literature for a long time. Most of the studies provide only a descriptive discussion of FDI and economic growth. Some of the available studies have used cross section regression methodologies. However, the time series studies do not conform to the FDI led growth hypotheses. Several other studies explore the direct and indirect relationship between FDI and growth. The empirical evidences from recent studies gave mixed results. Some studies even found that there was no causality between FDI and growth, while yet other studies found uni-directional relationship between FDI and growth. Many other studies reported bi-directional relationship between FDI and economic growth. The heterogeneous results that were observed in these studies may be due to the selection of the specific country and adoption of different methods, specifications and techniques used in the analysis. Even though several studies on FDI and growth in developing economies exist, comparatively, only a few studies have been done on India. In India, FDI inflows may directly influence growth or it may indirectly influence variables that affect growth. The country's policy changes and higher economic growth rates may provide the favourable business environment and attract further FDI inflows. A bi-directional causality between FDI and growth can also be expected. This implies that there could be a two-way causal link between FDI and economic growth in India. Hence, it becomes very important to establish the exact causal relationship between FDI and economic growth in India.

3. Trends, model specification and results

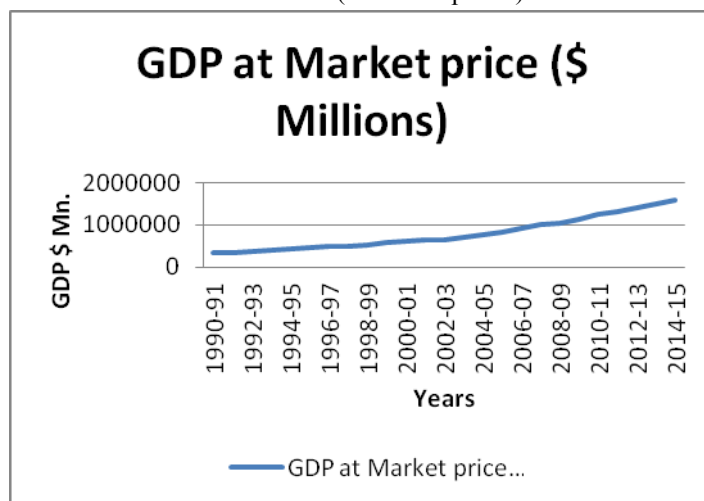
The trends of the variables viz., FDI, GDP and FDI as percentage of GDP are examined initially. The level of FDI in India from 1990-91 to 2014-15 is shown in figure no.1.

Figure no. 1 Trend of Foreign Direct Investment in India from 1990-91 to 2014-15

Source: Reserve Bank of India (RBI): Handbook of Statistics on Indian economy, various issues.

It can be observed that in 1990-91, FDI in India was just \$ 97 million. There was a spike in the inflows during 2003-04 to 2008-09. It reached \$ 41873 million in 2008-09. This was because of the changes made in the liberalisation policies made during the early 2000s. Since then, it was seen to fluctuate violently. The maximum was in 2011-12, when it reached \$ 46553 million. It can be understood that the business environment was favourable for more FDI inflows. From 2007-08 till 2014-15, it was above \$ 34000 million and it reached \$ 45148 million in 2014-15.

The trend of GDP at market prices in India from 1990-91 to 2014-15 is shown in figure no. 2.

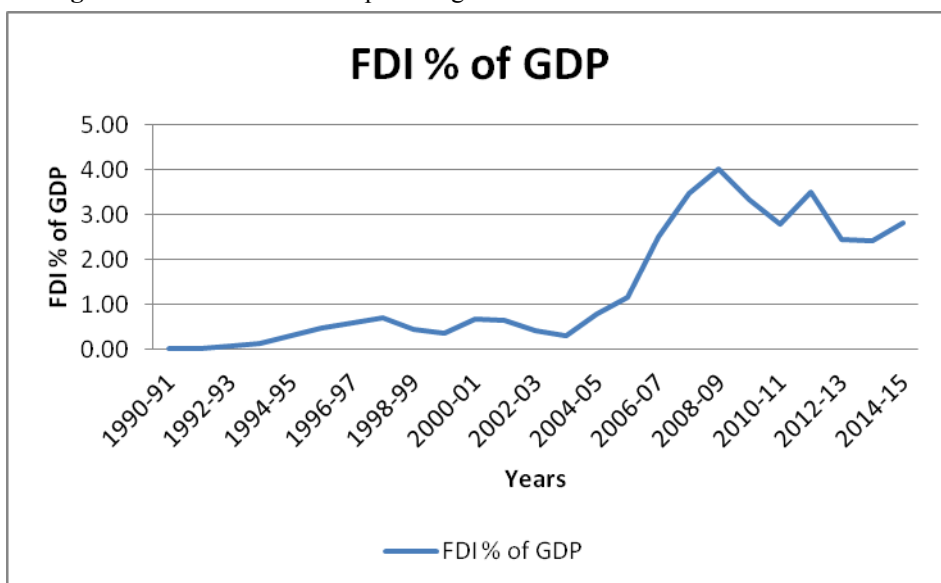
Figure no.2 Trend of Gross Domestic Product (at market prices) in India from 1990-91 to 2014-15

Source: Reserve Bank of India (RBI): Handbook of Statistics on Indian economy, various issues.

In 1990-91, GDP at market price was \$350241 million. It reached \$ 1000835 million in 2007-08. The rise in GDP at market prices was steeper during from 2002-03 to 2007-08. This era can be considered as the boom period in India. After this, GDP in India was rising but at a decreasing trend. Fluctuations in GDP of India were rampant. By 2014-15, it became \$ 1598324 million. On the whole, GDP at market prices showed a positive trend and was increasing steadily over the period from 1990-91 to 2014-15.

FDI as percentage of GDP in India from 1990-91 to 2014-15 is shown in figure no. 3.

Figure no.3 Trend of FDI as a percentage of GDP in India from 1990-91 to 2014-15



Source: Calculated by the author

It can be seen that in 1990-91, FDI as a % of GDP was as low as 0.03%. It was seen to fluctuate over the years and reached the peak in 2008-09, when it reached 4.03%. There was a steep rise from 2003-04 to 2008-09. This was the period when India was experiencing a period of boom and the conditions for FDI inflows were favourable. Thereafter, the variation was more irregular. The slumps experienced were because the Indian economy was facing recessionary pressure during those years. By 2014-15, it became 2.82%. Overall, FDI as a % of GDP was seen to fluctuate over the period from 1990-91 to 2014-15.

Having observed the trends, the next step is to do an empirical analysis to determine whether FDI influences the country's growth. Following Carkovic and Levine (2002) and Alfaro, Chanda, Kalemli and Sayek, (2004), the direct effect of

FDI on India's economic growth was analysed. The data on FDI inflows, however, includes foreign investment in all sectors of the Indian economy, viz. primary, manufacturing and service sectors. It has been mentioned previously that FDI generates externalities in the form of technology transfers, transfer of managerial know-how and access to markets. Understanding the relationship between inflation and real growth has always been a key concern in macroeconomic research. According to Rangarajan (1998) the question in essence, presupposes a possible trade-off between price stability and growth either in the long or short run. Further, empirical evidence tends to show that in the long run more outward-oriented countries register higher economic growth [Dollar and Kraay, (2004)]. Hence, inflation and trade openness have been added as variables in the growth equation. Inflation and trade openness are control variables that are expected to have an influence on growth. Inflation is expected to reduce growth hence will have a negative sign for the coefficient. Trade openness is expected to enhance growth by making trade as an engine of growth and hence the expected sign is positive.

The time series data for the following variables viz., Gross Domestic Product, Foreign Direct Investment, Gross Domestic Capital Formation, Exports, Imports and Inflation rate for the period from 1990-1991 to 2014-2015 were sourced from various issues of Handbook of Statistics on Indian Economy and Economic Survey 2014-15. Dritsaki, Dritsaki and Adamopoulos (2004) studied the causal relations between Foreign Direct Investment, economic growth and exports. On similar lines, this study examines the causal relation between the variables by using the model in the following form:

$$\text{GDP} = f(\text{FDI}, \text{INVST}, \text{INFL}, \text{OPEN}) [1]$$

Here, the proxy for economic growth is GDP (Gross Domestic Product). The independent variables are the following: FDI (Foreign Direct Investment), INVST (Domestic Investment), INFL (Inflation rate) and OPEN (Degree of openness).

It is assumed that there might be a long-term link between these variables. The aim is to analyse long-term causal relations between FDI and economic growth. FDI and its subsequent effects are considered to be one of the major determinants of economic growth. The channels could be through exports or openness of the economy. This might in turn lead to the growth of output levels and thereby enhance the growth of the economy.

It is important to ensure that the variables are integrated of the same order say one i.e., I (0). Therefore, a unit root test is conducted for each variable in the model. Augmented Dickey Fuller test is the most popular test for stationarity [Dickey and Fuller, (1979)]. This test is performed for verification of the ADF results. Unit root test is performed on the time series macroeconomic variables

which have been taken. This is because most macroeconomic time-series data have unit roots. Regressing non-stationary series on each other is bound to yield spurious regression results. Again, the determination of whether a variable shows a unit root indicates whether the variables exhibit certain characteristics such as mean reversion characteristics and finite variance, transitory shocks with the autocorrelations dying out with the increase in the number of lags under the alternative hypothesis of stationarity. So the initial step is to test the nature of the time series so as to determine whether it is stationary or non-stationary and also their order of integration. The order of integration helps in determining the subsequent long-run relationship among the variables. In order to test the long-term relations between the selected variables, it is necessary for the logarithmised time series to be stationary on the first differences I (1) and nonstationary on its own values. Stationarity test is performed with Augmented Dickey – Fuller test (ADF test) and the results are given in Table no.1.

Table no.1 Results of ADF test

Variable	Augmented Dickey-Fuller test results				
	ADF without trend		ADF with trend		
	Level	1 st Difference	Level	1 st Difference	
LNGDP	1.235423	-3.885711*	-1.705049	-4.010241**	
FDI	-0.922319	-3.652481**	-2.250877	-3.557038***	
INVST	-1.348034	-4.534082*	-1.530506	-4.484602*	
INFL	-3.544064**	--	-3.5618***	--	
OPEN	-1.117684	-4.191753*	-1.430085	-4.199811**	

Note: LNGDP, FDI, INVST, INFL and OPEN represent log of GDP, FDI (% of GDP), investment, inflation rate and trade openness, respectively. * Represents significance at 1% level, ** Represents significance at 5% level, *** Represents significance at 10% level.

Source: Author's own estimation based on data obtained from the Reserve Bank of India, Handbook of Statistics on Indian Economy and Economic Survey 2014-15.

The results of the ADF test are shown in Table no.1. The first part of the table contains data showing the value of tested non-stationary time series at their values and the second part of the table records data indicating the stationarity of time series at first differences. This indicates that all the variables (LNGDP, FDI, INVST and OPEN), except inflation (INFL) are integrated of order one i.e. I (1). Whereas, the variable inflation is integrated of order zero i.e. I (0). In other words, the results show that while all the variables are non-stationary at their level but stationary at first difference, only inflation is stationary at its level form.

Testing the unit root properties of the variables is considered as the necessary condition for doing the cointegration test and also to avoid the problem of spurious regression. The ADF unit root test is used to check for the order of integration of the variables used in this paper. The assumption for further test for

long term relationships between the specified variables is met since the time series stationarity was proved in the first differences. The results show that all the variables, except inflation, are stationary at first difference.

This allows us to apply the Johansen co-integration test for the variables with integration of same order. Cointegration shows the presence of a linear combination of non-stationary variables that are stationary. Also, the presence of cointegration implies that a stationary long-run relationship among the series is present. If cointegration does not exist, it implies that the linear combination is not stationary and the variable does not have a mean to which it returns. The procedure adopted in this paper was developed and expanded by Johansen and Juselius (1990). It is a representation of the approach of analysing multivariate cointegrated systems. The advantage of the Johansen Vector Auto-Regressive (VAR) procedure is that it allows the simultaneous evaluation of multiple relationships. Again, it does not impose any prior restrictions on the cointegration space. The Johansen cointegration approach tests for the cointegration rank for a VAR process. It estimates the TRACE and LMAX stats, the Eigen values, and the eigenvectors also. It sums up the long-run equilibrium coefficients, the adjustment coefficients and the covariance matrix of the errors. The R-squares for each of the equations in the VECM can also be found. Again, linear restriction on the long-run equilibrium coefficients is also tested. In this context, the Johansen cointegration test is used among LNGDP, FDI, INVST and OPEN since these variables are integrated of the same order i.e. I (1).

3.1. Long term relationship test between FDI and GDP

Johansen- Juselius test for cointegration was used to test long term relationships between FDI, GDP and the other variables. It is necessary to define appropriate time lag length within this test. Here, an Akaike criterion was used while determining the appropriate lag length, which was applied for the non-differentiated VAR model estimation. Two periods with an appropriate lag length was proved. Long term relationships test between FDI, GDP, INVST and OPEN was performed on the basis of the following equation.

$$LGDP = \alpha + \beta_1 LFDI + \beta_2 LINVST + \beta_3 OPEN + u \quad [2]$$

The dependent variable is gross domestic product and independent variables are foreign direct investment, domestic investment and openness. Long term relationships between the variables in Johansen test are examined on the basis of two tests, Trace test and Max-eigenvalue test. Table no.2 shows the cointegration test results.

Table no. 2 Results of Johansen cointegration test

Trace statistics			
Null	Alternative	Statistics	95% critical value
$r = 0$	$r \geq 1$	81.61280*	47.85613
$r \leq 1$	$r \geq 2$	46.14323*	29.79707
$r \leq 2$	$r \geq 3$	14.50877	15.49471
Maximum eigenvalue test			
Null	Alternative	Statistics	95% critical value
$r = 0$	$r \geq 1$	35.46957*	27.58434
$r \leq 1$	$r \geq 2$	31.63446*	21.13162
$r \leq 2$	$r \geq 3$	14.50810*	14.26460
$r \leq 3$	$r \geq 4$	0.000667	3.841466

Note: r stands for the number of cointegrating vectors; the lag length is determined by the optimum value of Akaike Information Criterion and Schwartz Bayesian Criterion. * Denotes rejection of null hypothesis at 5% level of significance.

Source: Author's own estimation based on data obtained from the Reserve Bank of India, Handbook of Statistics on Indian Economy and Economic Survey 2014-15.

The Trace statistic as well as the maximum-Eigen value statistic reject the null of no-cointegration among the variables. Trace test indicates 2 cointegrating equations at the 0.05 level, whereas the Max-eigenvalue test indicates 3 cointegrating equations at the 0.05 level. Further, while the former statistic shows that there is the existence of the two cointegrating vectors, the latter shows that three cointegrating vectors exist in the model. In other words, the results show that the variables are cointegrated or there exist long run equilibrium relationship among the variables. Table no. 3 shows the normalised cointegrating coefficients.

Table no. 3 Normalised cointegrating coefficients

LNGDP	FDI	INVST	OPEN
1.000000	14.34050	-0.026521	5.622281
	(1.77653)	(0.00873)	(0.33210)
	[8.07219]	[-3.03791]	[16.92948]

Note: Standard error in () and t- statistics in []

Source: Author's own estimation based on data obtained from the Reserve Bank of India, Handbook of Statistics on Indian Economy and Economic Survey 2014-15.

The normalized cointegrating coefficients represent the long run relationship between economic growth and the independent series in the model. It can be observed that FDI and openness have a negative impact whereas Domestic investment has a positive impact on economic growth respectively.

From the results presented in the above tables, it can be inferred that growth is influenced by domestic investment and not by FDI and openness.

4. Conclusion

The economic and technological factors in the host country have a significant influence on the growth of international production. Moreover, FDI inflows and the liberalised trade policy regime promote this growth. Given this context, globalisation provides an unparalleled opportunity for the developing countries to achieve faster economic growth through enhanced trade and investment. Among these, international trade was considered more important during the 1970s. Hence, international trade grew more rapidly than FDI. However, after the 1980s, this position changed radically, since the global FDI flows started to rise sharply. This was the period when the enhanced global FDI flows started transferring technologies significantly. FDI inflows enabled the foreign investors to utilise the assets and resources more efficiently. The host countries acquired the state of the art technologies. As a result of this, procurement, production and marketing techniques became more efficient. This paved the way for more international production and trade.

In India, before the 1990s, the FDI inflow was insignificant. This was due to the fact that there were a lot of policy restrictions and the government was more concerned about the impact FDI had on the economy. Post 1990s, with the new economic policy, the Indian government began to ease restrictions on FDI. Incentives were offered in an effort to attract investment. Overall, the business environment was made conducive and with this, FDI in India grew significantly. The government policies and the overall attitude towards FDI as well its characteristics have changed considerably since then.

The review of literature, in general, found a positive effect of FDI inflows on the economic growth in different countries. There were also studies with contradicting opinions. However, this study examined the causal nexus between FDI and economic growth in India from 1990-91 to 2014-15. The impact of FDI on economic growth in India since 1991 was also investigated. GDP growth was employed as a measure of economic growth. It was found that at the aggregate level, FDI does not appear to have a positive effect on the economic growth in India. The effects of FDI on economic growth might vary across sectors, but no aggregate effects were found. The data series were checked for the stationarity using Augmented Dickey Fuller (ADF) Test. Johansen Cointegration test was used to find out the level of consistence of cointegration. It was found that economic growth was influenced by domestic investments and not by FDI. The empirical evidence presented in this study suggests that India should consider more carefully whether a policy of subsidising more FDI inflows is indeed beneficial as a means to enhance growth prospects. Further research could suggest whether better policies should be formulated and the conditions to maximize the benefits from FDI inflows to appropriate sectors should be improved.

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