International Journal of Asian Business and Information Management
Volume 11 • Issue 1 • January-March 2020

Cointegration and Causality Study Among Inward FDI, Economic Growth and Exports: An Indian Perspective

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ABSTRACT

One significant feature of liberalisation for India has been a greater openness to foreign direct investment (FDI) as a means of acquiring technologies, skills and access to international markets, and of entering dynamic trade and production. The study analyses the empirical relationship between inward FDI, economic growth and exports of India from 1970-71 to 2013-2014. The objective of this article is to investigate the relationship between FDI, economic growth and exports empirically. The error correction coefficient value indicates a 15.02% movement back towards equilibrium following a shock to the model, one time period later. OLS indicate significant long-term causality relationship among the variables with high R2 value to the tune of 0.758660. The Wald Test establishes short-run causality from economic growth to inward FDI, and from exports to inward FDI. A one-way causality relationship is running from exports to inward FDI. Economic growth causes inward FDI, but, inward FDI is not causing economic growth. Exports cause inward FDI, and inward FDI does not cause exports.

KEYWORDS

Causality, Cointegration, Economic Growth, Error Correction, Exports, Foreign Direct Investment, Ordinary Least Square

INTRODUCTION

Foreign Direct Investment (FDI) occupies a special place in establishing a connection between economic development and globalisation. FDI brings scarce capital and technology from rich to developing countries. Companies in rich countries can earn high returns while accelerating growth in developing countries. The past two to three decades have seen a significant policy shift in the developing world, from inward-looking import substitution to outward-looking, market-determined strategies. The reasons for this shift are complex, but mainly to do with the inefficiencies of import substitution, the growth of globalized production and the success of the export-oriented Asian newly industrialised economies.

Remarkable features of globalisation in the 1990s for India was the flow of private capital in the form of FDI, which is an important source of development finance that contributes to productivity

DOI: 10.4018/IJABIM.2020010104

gains by providing new investments, better technology, management expertise, and export markets to our economy. Given the resource constraints and lack of investment in developing India, market forces and the private sector are increasingly relying on FDI as the engine for economic growth. One key feature of liberalisation for India has been a greater openness to FDI as a means of acquiring technologies, skills and access to international markets, and of entering dynamic trade and production systems internal to multinational enterprises (MNE).

In the context of the new theory of economic growth, FDI is considered as an engine of growth of mainstream economies. The exact relationship between foreign MNCs and their host countries varies considerably between countries. An empirical assessment of the role of FDI in a host country's export performance is important since exports have been for a long time viewed as an engine of economic growth. There is a widely shared view that FDI promotes exports of host countries by (a) augmenting domestic capital for exports, (b) helping transfer of technology and new products for exports, (c) facilitating access to new and large foreign markets, and (d) providing training for the local workforce and upgrading technical and management skills. On the other hand, however, it is also suggested that FDI may (a) lower or replace domestic savings and investment; (b) transfer technologies that are low level or inappropriate for the host country's factor proportions; (c) target primarily the host country's domestic market and thus not increase exports; (d) inhibit the expansion of indigenous firms that might become exporters; and (e) not help developing the host country's dynamic comparative advantages by focusing solely on local cheap labor and raw materials. Rich theoretical insights accompanied with empirical analyses of the issue are needed as well for a better understanding of the FDI-export link.

Literature studies indicates that there is no consistency in establishing that inward FDI is creating economic growth through an increase in gross domestic product or through an increase in exports, which necessitates a thorough examination with recent set of data. This research attempts to study the macro level dimension of inward FDI to India from 1970-1971 to 2013-2014. Reason for choosing this period is- inward FDI was allowed in India from 1970 onwards. Major policy level changes on inward FDI was undertaken by the Central government which took office on 26th May 2014. Amendments were introduced in the existing policy structure which can effect a change in the existing inward investment scenario. Author undertook this research from mid of 2015 and completed in 2017.

The study analyzes the theoretical and empirical relationship between inward FDI, economic growth and exports of India, taking the time series approach. Purpose of this research is to study and empirically investigate relationship between inward FDI, economic growth and exports. Data for inward FDI is taken from UNCTAD statistics, economic growth is proxied by Gross Domestic Product (GDP), and data for GDP is taken from Reserve Bank of India statistics of macroeconomic aggregates. GDP at factor cost constant price is taken and expressed in rupees in billions, with the base year 2004-05. Inward FDI data is taken from UNCTAD database, and it is expressed in US dollar in millions at current prices and current exchange rates. Exports data is taken from the Reserve bank of India statistics on trade and balance of payment and is expressed in rupees in billion. Author retained the statistics as mentioned by authentic sources, as the methodology of conversion of currencies can create many data conversion issues.

LINK BETWEEN INWARD FDI, ECONOMIC GROWTH AND EXPORTS-REVIEW OF LITERATURE

The diverse and significant role FDI plays in enhancing growth and exports has kindled the interest of many researchers. The pioneering conceptual insight of Hymer (1960) tried to answer the question, why is there FDI? The unique feature of FDI is the mechanism with which MNE maintains control over productive activities outside its national boundaries (Dunning & Rugman, 1985). Saltz (1992) examined the effect of FDI on economic growth for third world countries, his empirical results revealed negative correlation between level of FDI and growth during the period 1970-1980. Barrell and

Pain (1999) explored the benefits of FDI by United States to multinationals in four European Union countries and found that FDI may affect the host country's performance positively in cases where there are transfers of technology and knowledge. Carcovic and Levine (2002) assess the relationship between FDI and economic growth for 72 countries from 1960 to 1995 using Generalized Method of Moments (GMM) panel estimator. Results indicated that for both developed and developing economies FDI inflows did not exert an independent influence on economic growth. Sharma (2000) indicates that, FDI appears to have statistically no significant impact on export performance although the coefficient of FDI has a positive sign.

In the case of South East Asian and Latin American countries, Zhang (2001) identified that, FDI tends to be more likely to promote economic growth when host countries adopt liberalised trade regime, improve education and thereby human capital conditions, encourage export-oriented FDI, and maintain macroeconomic stability. Results of the study undertaken by Carkovic and Levine (2002) indicate that the exogenous component of FDI does not exert robust, positive influence on economic growth. After checking for robustness check and sensitivity analysis, they found that FDI inflows do not exert an independent influence on economic growth in the case of 82 countries including India.

Chandra (2003) examine causality between export growth and income growth. The evidence suggests bi-directional causality between real exports and real income in the long run. However, the long-run causality running from income to exports is much stronger than that running from exports to income. In the short run, only the terms of trade changes are significant in explaining export growth. Helpman et al. (2004) developed in their paper a model of international trade and investment in which firms can choose to serve their domestic market, to export, or to engage in FDI to serve foreign markets. The results show a robust cross-sectoral relationship between degree of dispersion in firm size and tendency of firms to substitute FDI sales for exports. Size of this effect is the same order of magnitude as trade frictions. They have identified a new element—namely, within-sectoral heterogeneity—that plays an important role in the structure of foreign trade and investment. Kholdy and Sohrabian (2005) investigate the interaction between financial markets, foreign direct investment, and economic growth using Granger Causality tests to a panel of 25 countries from 1975 to 2002. Results reveal bi-directional causality between growth and financial development where growth causes financial development in more countries than the reverse.

Seetanah ander types of capital. Moreover, the study confirms the presence of important endogeneity in the FDI-growth relationship as FDI is not only seen to lead growth but to follow growth as well. Goldar & Rashmi, (2007) analyses the role played by FDI on trade, results arrived indicate that trade liberalization had a favourable effect on FDI flows in India, regions having greater extent of international trade attract greater amount of FDI. Authors was of the view that though liberalization has led to a substantial increase in intra-industry trade, much of the intra-industry being horizontal in India is not found to have a strongly favourable effect on FDI.

Chandana and Nunnenkamp (2008) found weak evidence for a causal link between FDI and output growth in services sector, as manufacturing output appears to have been promoted by FDI in the services sector through spillovers across sectors. They also found that FDI stocks and output are cointegrated in the long run and long run Granger causality tests is running from output growth to FDI stocks. Majeed and Ahmad (2008) identifies factors like gross domestic product, economic growth, domestic absorption and exports positively affect FDI, and external debt and balance of payment deficit important in determining the inflow of FDI. FDI promotes productivity growth only when the host country reaches a threshold level of human capital; and FDI promotes capital growth only when a certain level of financial development is achieved (Wang et al., 2009). Anwar and Nguyen (2010) using simultaneous equations model. indicates that impact of FDI on economic growth in Vietnam will be larger if more resources are invested in education and training, financial market development and in reducing the technology gap between foreign and local firms.

Moudatsou and Kyrkilis (2011) attempts to address the causal-order between inward FDI and economic growth using a panel data set for two different Economic Associations that is EU (European

Union) and ASEAN (Association of South Eastern Asian Nations) from 1970-2003. Three possible cases were investigated: 1) Growth-driven FDI; 2) FDI-led growth; and 3) two-way causal link between FDI and economic growth. Empirical results from heterogeneous panel analysis indicate path dependent and country-specific factors. Regarding EU countries, results support the hypothesis of GDP -FDI causality. Regarding the ASEAN, there is a two-way causality between GDP per capita and FDI like the cases of Indonesia and Thailand. In the cases of Singapore and the Philippines, however, FDI is motivated by the host country's GDP growth.

FDI significantly crowds in manufacturing exports, and effect of such export are stronger in physical capital, human capital and technology-intensive sectors (Rahmaddi & Ichihashi, 2012). Cointegration test confirmed the existence of a long-run equilibrium relationship between FDI and economic growth. Granger causality tests confirmed the presence of uni-directional causality running from economic growth to FDI in the case of India from 1990-91 to 2010-2011 (Ray, 2012). Gould, Tan, and Ememgholi (2014) investigates reasons for low inflow of FDI in South Asian countries and lessons which these countries have to learn to attract more FDI inflows. They use a novel empirical model that accounts for possible trends in convergence in the ratio of FDI to GDP between countries and cross sections data for 78 countries of which, 52 are developing countries, from 2000 to 2011. The analysis found two key factors like high overall regulatory restrictions on FDI and specific restrictions placed on doing business with other countries. These two factors reduce the benefits to cross-border investments. Liberalizing policy constraints, modest corporate tax and improving governance and transparency could help to improve FDI flows to Asian countries substantially.

DATA, ECONOMETRIC SPECIFICATIONS AND METHODOLOGY

This study examines the empirical relationship between inward FDI, economic growth and exports from 1970-71 to 2013-2014. When dealing with time series data, many econometric issues can influence the parameters. Most of the macroeconomic data are non-stationary which means they tend to exhibit a deterministic and stochastic trend. Therefore, it is recommended that 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. The variables are converted into their natural log form and checked for autocorrelation and stationarity.

Cointegration Analysis

The concept of Cointegration was introduced in the econometric literature by Olive Granger (Granger, 1981). The long run relationship between variables can be established by following Cointegration. The test of cointegration, tests whether there exists a stationary linear combination of non-stationary variables. If such combination is found, it is inferred as an equilibrium relationship between the variables. There are many methods for finding cointegration. Johansen-Julius (JJ) Method of Cointegration is used in this research, as this approach provides a multivariate framework and allows for more than one cointegration vector in the estimated model and thereby prevents any loss of efficiency.

Error Correction Model

Once the variables are found to be cointegrated, the next step is to use an error correction model (ECM) following JJ method to estimate the short-run dynamics of the model. The link between the cointegration technique and the error correction model is formalized in the Granger Representation Theorem (1983). The error correction enables the empirical researcher to glean information about the long run and short-run relationships among relevant variables from a given set of data.

Hypotheses

H_1: There is no Cointegration Relation existing among inward FDI, economic growth and exports
H_2: There is no short run relation existing among inward FDI, economic growth and exports
H_3: There is no causal relation existing among inward FDI, economic growth and exports
H_4: There is no causal relation existing between inward FDI and economic growth
H_5: There is no causal relation existing among inward FDI and exports

From the ADF test it is understood that the three variables, inward FDI, GDP and exports are non-stationary at levels (I (0)) and become stationary at first differenced (I (1)). This means their order of integrity is the same for all the three variables, which is a necessary condition for applying cointegration. Cointegration test is undertaken between inward FDI, economic growth and exports (see Table 1).

Results of the Cointegration Analysis

Table 1 indicates the long-run cointegration relationship between inward FDI and economic growth and exports. The Trace test statistics indicate the existence of two cointegrating equations at 5% level of significance. Maximum eigen statistics also indicates two cointegration equation at 5% level of significance. This means that the three variables inward FDI, economic growth and exports have a long run equilibrium relationship among them. Hence, we reject the null hypothesis of no cointegration relation at 5% level of significance. This phenomenon supports the theoretical explanations that there exists a formal long-run relationship between inward FDI and economic growth, the positive outcomes of this two particular phenomena is reflected through higher exports from India.

The normalized cointegrating coefficients are also positive. The normal cointegrating equation is positive and indicates that a 1% increase in inward FDI will have 1.596% (0.015960) change in economic growth of India and 35.20% (0.352037) change in exports from India. In other words, a 1% inward FDI can create economic development to the tune of 1.596% and a 1% inward FDI can create 35.20% of exports.

After establishing the long-term cointegration relation among inward FDI, economic growth and exports, the next step is to check for the existence of short-term equilibrium relation. This is shown through the error correction term. The error term is used to tie the short-run behaviour of economic growth and exports to its long-run value.

Results of Error Correction Model

The Error Correction Model is shown in Table 2. First, it shows one cointegrating equation for economic growth and exports, along with standard error and trace statistics, followed by the error correction term for the three variables. Since inward FDI is the dependent variable, it comes first. The coefficient of error correction term is negative, which shows a statistically significant relationship for economic growth and exports, and also ensures a satisfactory convergence rate of equilibrium point per period. The error correction coefficient value is -1.50295, which indicates a 15.02% movement backwards towards equilibrium following a shock to the model, one period later. This error correction model establishes the cointegrating relation among the independent and dependent variables and also ensures for the existence of long-run causality relationship existing among the variables. To know the significance of the error correction term, we need to run the least square regression, with the help of the system equation of the dependent variables. Dependent variables here are economic growth and exports.

Table 1. Cointegration test

Date: 05/05/16 Time: 23:49				
Sample (adjusted): 3 44				
Included observations: 42 after adjustments				
Trend assumption: Linear deterministic trend				
Series: IFDI GDP EX				
Lags interval (in first differences): 1 to 1				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.764708	79.21969	29.79707	0.0000
At most 1 *	0.339431	18.44876	15.49471	0.0174
At most 2	0.024303	1.033317	3.841466	0.3094
Trace test indicates two cointegrating equation(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.764708	60.77093	21.13162	0.0000
At most 1 *	0.339431	17.41545	14.26460	0.0154
At most 2	0.024303	1.033317	3.841466	0.3094
Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):				
IFDI	GDP	EX		
0.000169	2.70E-06	5.95E-05		
-3.04E-05	-0.00038	0.000956		
-0.00019	-3.75E-05	0.001095		
Unrestricted Adjustment Coefficients (alpha):				
D(IFDI)	-2414.45	518.8726	590.1188	
D(GDP)	163.5799	-247.955	20.99815	
D(EX)	134.0269	25.54250	19.16205	
1 Cointegrating Equation(s):	Log likelihood	-983.972		

continued on following page

Table 1. Continued

Normalized cointegrating coefficients (standard error in parentheses)				
IFDI	GDP	EX		
1.000000	0.015960	0.352037		
	(0.20301)	(0.62003)		
Adjustment coefficients (standard error in parentheses)				
D(IFDI)	-0.40826			
	(0.11433)			
D(GDP)	0.027660			
	(0.01266)			
D(EX)	0.022663			
	(0.00418)			
2 Cointegrating Equation(s):	Log likelihood	-975.265		
Normalized cointegrating coefficients (standard error in parentheses)				
IFDI	GDP	EX		
1.000000	0.000000	0.392501		
		(0.38495)		
0.000000	1.000000	-2.53526		
		(0.42966)		
Adjustment coefficients (standard error in parentheses)				
D(IFDI)	-0.42402	-0.20468		
	(0.11523)	(0.25618)		
D(GDP)	0.035191	0.095139		
	(0.01079)	(0.02399)		
D(EX)	0.021887	-0.00939		
	(0.00418)	(0.00929)		

Results of Ordinary Least Square Regression and Wald Test

Ordinary Least Square (OLS) regression will help to identify the effect of independent variables on the dependent variables. Results of the least square regression will give us an understanding of the significance, as well as the short-term dynamic relationship among the variables. Table 3 shows the OLS Regression. Inward FDI is the dependent variable and, economic growth and exports are the two dependent variables. In the table above of the Ordinary Leas Square regression, C (1) indicates long-run causality and C (2) to C (8) indicates the short run causality. C (1) represent the speed of adjustment towards long-run equilibrium. The coefficient of C (1) must be significant, and the sign must be negative. In the result above the coefficient of C (1) is -1.502949 and the t statistics is also negative, and it is significant with a probability of 0.0000. This means that there is long-run causality between the two independent variables that is economic growth and exports to the dependent variable, inward FDI, which is also statistically significant. It further indicates that the two independent variables have an influence upon the dependent variable in the long run, which ensures that there is a long run causality running from economic growth and exports to inward FDI.

Table 2. Vector error correction model

Vector Error Correction Estimates			
Date: 05/05/16 Time: 23:53			
Sample (adjusted): 4 44			
Included observations: 41 after adjustments			
Standard errors in () & t-statistics in []			
Cointegrating Eq:	CointEq1		
IFDI(-1)	1.000000		
GDP(-1)	0.098932		
	(0.08355)		
	[1.18410]		
EX(-1)	-1.27931		
	(0.57285)		
	[-2.23324]		
C	-5283.03		
Error Correction:	D(IFDI)	D(GDP)	D(EX)
CointEq1	-1.50295	-0.01844	0.001209
	(0.17501)	(0.02864)	(0.00940)
	[-8.58775]	[-0.64393]	[0.12867]
D(IFDI(-1))	0.448769	0.012084	-0.08158
	(0.12339)	(0.02019)	(0.00662)
	[3.63713]	[0.59841]	[-12.3147]
D(IFDI(-2))	2.285549	0.105379	0.049878
	(0.34751)	(0.05687)	(0.01866)
	[6.57689]	[1.85285]	[2.67318]
D(GDP(-1))	3.341070	0.520926	0.320788
	(0.97519)	(0.15960)	(0.05236)
	[3.42608]	[3.26394]	[6.12656]
D(GDP(-2))	-0.27293	0.281800	-0.01465
	(1.48650)	(0.24328)	(0.07981)
	[-0.18361]	[1.15832]	[-0.18360]
D(EX(-1))	17.30604	0.617053	0.642599
	(3.29621)	(0.53946)	(0.17698)
	[5.25029]	[1.14383]	[3.63089]
D(EX(-2))	-9.73504	-0.44303	-0.0692
	(1.46380)	(0.23957)	(0.07860)
	[-6.65051]	[-1.84926]	[-0.88043]

continued on following page

Table 2. Continued

C	-8678.2	127.1194	-128.614
	(1184.30)	(193.825)	(63.5881)
	[-7.32768]	[0.65585]	[-2.02261]
R-squared	0.758660	0.858365	0.972983
Adj. R-squared	0.707466	0.828322	0.967252
Sum sq. resids	2.64E+08	7069039.	760841.0
S.E. equation	2827.982	462.8318	151.8413
F-statistic	14.81949	28.57054	169.7806
Log likelihood	-379.567	-305.359	-259.663
Akaike AIC	18.90569	15.28578	13.05673
Schwarz SC	19.24005	15.62014	13.39108
Mean dependent	687.3575	1255.597	464.1559
S.D. dependent	5228.640	1117.031	839.0743
Determinant resid covariance (dof adj.)		1.47E+16	
Determinant resid covariance		7.67E+15	
Log-likelihood		-924.3478	
Akaike information criterion		46.40721	
Schwarz criterion		47.53566	

To identify the short run causality, Wald Test is performed. Wald test is performed separately with the short run coefficients of economic growth and exports. Short run coefficients are indicated by C (2), C (3), C (4) and C (5). If the null hypothesis C (2) =C (3) =C (4) =C (5) =0 is rejected, then short-run causality is ensured for Inward FDI and economic growth. If the null hypothesis C (6) =C (7) =0 is rejected, then it ensures short-run causality for inward FDI and exports.

In the Wald test, the F statistics and Chi-square are significant with 0.000, which means there is short-run causality running from economic growth to inward FDI (Table 4). In the Wald test conducted for identifying the short run causality between inward FDI and exports, the F statistics and Chi-square is significant with 0.000, which means C (6) and C(7) are not zero, it rejects the null hypothesis at 1% level of significance (Table 5). There is short-run causality running from exports to inward FDI.

The above Ordinary Least Square Model is stable as the R square value is 0.758660 that is 75.86%, which means, the 75.86% of changes occurring in the independent variable are explained jointly by the two dependent variables economic growth and exports. Individually except C (5), in all the other cases, it is significant at 1% confidence level. The F statistics is 14.81 with a significance of 0.000. Durbin Watson test statistics is 2.39 which indicates that the model is free from auto correlation. High R^2 value to the tune of 75.86%, the significant statistical relationship of all independent variables at 1% level of confidence, the absence of autocorrelation, all the three phenomena, ensure the statistical stability of the model. This model helps us to empirically confirm the theoretical relationship existing between inward FDI, economic growth and exports.

Pairwise Granger Causality Test

To check for the direction of causality between test variables, the Granger Causality Test is used. Causality can give us an understanding of the direction of relation moving from one variable to

Table 3. OLS regression

Dependent Variable: D(IFDI)				
Method: Least Squares				
Date: 05/05/16 Time: 23:54				
Sample (adjusted): 4 44				
Included observations: 41 after adjustments				
D(IFDI) = C(1)*(IFDI(-1) + 0.0989324439313*GDP(-1) - 1.27931444967				
*EX(-1) - 5283.02499495) + C(2)*D(IFDI(-1)) + C(3)*D(IFDI(-2)) + C(4)				
*D(GDP(-1)) + C(5)*D(GDP(-2)) + C(6)*D(EX(-1)) + C(7)*D(EX(-2)) +				
C(8)				
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-1.502949	0.175011	-8.587745	0.0000
C(2)	0.448769	0.123385	3.637127	0.0009
C(3)	2.285549	0.347512	6.576887	0.0000
C(4)	3.34107	0.975187	3.426081	0.0017
C(5)	-0.272934	1.486503	-0.183608	0.8554
C(6)	17.30604	3.296205	5.250292	0.0000
C(7)	-9.735041	1.463804	-6.650508	0.0000
C(8)	-8678.197	1184.303	-7.327684	0.0000
R-squared	0.75866	Mean dependent var		687.3575
Adjusted R-squared	0.707466	S.D. dependent var		5228.64
S.E. of regression	2827.982	Akaike info criterion		18.90569
Sum squared resid	2.64E+08	Schwarz criterion		19.24005
Log-likelihood	-379.5667	Hannan-Quinn criteria.		19.02745
F-statistic	14.81949	Durbin-Watson stat		2.398378
Prob(F-statistic)	0.0000			

another. The direction can be one way-unidirectional, two ways-bidirectional, and, no causality. Pairwise Granger Causality Test results are shown in Table 6.

Results of the Granger Causality Test indicates that, with two-period lag, there is a one-way causality between economic growth and inward FDI-unidirectional causality. The same kind of relationship also exists between inward FDI and exports. Fourth and fifth null hypotheses are rejected at 1% level of confidence. Economic growth causes inward FDI, as the probability value is 0.01, so the null hypothesis of no causality is rejected. Exports cause inward FDI, which is shown from the probability value of 0.0041. So economic growth causes inward FDI, but inward FDI does not cause economic growth. Exports cause inward FDI, and inward FDI does not cause exports.

RESULTS AND DISCUSSIONS

The objective of this paper is to identify the long-run equilibrium relationship between inward FDI, economic growth and exports. Cointegration analysis is carried out to identify the long-term equilibrium relationship between inward FDI, economic growth proxied by gross domestic product

Table 4. Wald test for inward FDI and economic growth

Equation: Untitled			
Test Statistic	Value	df	Probability
F-statistic	24.08576	(4, 33)	0.0000
Chi-square	96.34306	4	0.0000
Null Hypothesis: C(2)=C(3)=C(4)=C(5)= 0			
Null Hypothesis Summary:			
Normalized Restriction (= 0)		Value	Std. Err.
C(2)		0.448769	0.123385
C(3)		2.285549	0.347512
C(4)		3.341070	0.975187
C(5)		-0.272934	1.486503

Table 5. Wald test for inward FDI and exports

Test Statistic	Value	df	Probability
F-statistic	22.41490	(2, 33)	0.0000
Chi-square	44.82980	2	0.0000
Null Hypothesis: C(6)=C(7)=0			
Null Hypothesis Summary:			
Normalized Restriction (= 0)		Value	Std. Err.
C(6)		17.30604	3.296205
C(7)		-9.735041	1.463804

Table 6. Granger causality test

Pairwise Granger Causality Tests				
Sample: 1 44, Lags: 2				
Null Hypothesis:	**Obs**	**F-Statistic**	**Prob.**	**Inference**
GDP does not Granger Cause IFDI	38	5.31827	0.01	Reject null hypothesis
IFDI does not Granger Cause GDP		0.1087	0.8973	Accept Null Hypothesis
EX does not Granger Cause IFDI	38	6.5196	0.0041	Reject null hypothesis
IFDI does not Granger Cause EX		2.96164	0.0656	Accept Null Hypothesis

and exports. All the three variables were integrated in the same order, which satisfies the important precondition for applying cointegration. The presence of cointegrating relationship was established from trace test statistics and maximum eigen value. The null hypothesis was rejected at 1% level of significance. Cointegration equation suggested two cointegrating equation among the variables.

An error correction term will help to identify the cointegration coefficient and establish the speed with which adjustments will take place in the equilibrium condition. The coefficient of error

correction term is negative, which shows a statistically significant relationship for economic growth and exports, and also ensures a satisfactory convergence rate of equilibrium point per period. The error correction coefficient value is -1.50295, which indicates a 15.02% movement backwards towards equilibrium following a shock to the model, one period later. This error correction model establishes the cointegrating relation among the variables and also ensures for the existence of long-run causality relationship existing among the variables.

To know the significance of the error correction term, an ordinary least square regression was undertaken, with the help of the system equation of the dependent variables. Dependent variables here are economic growth and exports. Results of the least square regression indicate a significant long-term causality relationship among the variables. The OLS model is statistically significant with high R^2 value to the tune of 0.758660 that is 75.86%, the significant statistical relationship of all independent variables at 1% level of confidence accompanied with an absence of autocorrelation ensured from Durbin Watson statistics.

Wald Test is performed to identify the short run causality. Wald test is performed separately with the short run coefficients of economic growth and exports. In the Wald test, the F statistics and Chi-square is significant for both the independent variables, with a probability of 0.000, which means there is short-run causality running from economic growth to inward FDI and also from exports to inward FDI.

The same relationship is ensured in the Granger Causality test conducted to understand the direction of causality running among variables. There is a unidirectional causality running from economic growth to inward FDI. A one-way causality relationship is running from exports to inward FDI. Economic growth causes inward FDI, but, inward FDI is not causing economic growth. Exports cause inward FDI, and inward FDI does not cause exports.

SUGGESTIONS

The above results indicate that liberalization has created the necessary conditions for inflow of capital in the form of FDI, but it is not the sufficient condition for enhancing the benefits arriving from the operation of foreign firms. As Lall and Narula (2011) indicates, removal of restrictions on FDI does not create the complementary factors that MNCs need, but not only allows them to exploit existing capabilities more freely. FDI response is more vigorous when local capabilities are strong, and when liberalization takes place, then new capabilities are created. This particular phenomenon is still not been internalized in policy recommendations on FDI in developing countries- much of this still proposes liberalization not just as a necessary but also as a sufficient condition for attracting FDI and extracting most development benefits from it.

Effect of FDI on domestic investments and growth depend very much on the nature or quality of FDI. Certain types of FDI tend to have more favourable developmental externalities than others. In that context, attention needs to pay by host countries to the quality of FDI inflows besides attracting greater magnitudes of FDI. Recent work has shown that host country policies have an important bearing on the quality of FDI inflows received (Kumar, 2002). Governments have employed various measures to improve the overall quality of FDI inflows. These include selective policies to target more desirable FDI inflows. Many governments in developed, as well as developing countries, have imposed performance regulations like local content requirements on MNEs to intensify generation of local linkages or export obligations for triggering a burst of export-focused investments (Moram, 1998; Kumar, 2001).

As suggested by Kumar, (2005), this study suggest that the overall macroeconomic performance continues to exercise a major influence on the magnitude of FDI inflows by acting as a signalling device for foreign investors about the growth prospects for the potential host economy.

REFERENCES

Aliber, R. Z. (1983). Money, Multinationals and Sovereigns. In C. P. Kindleberger & D. Audretsch (Eds.), *The Multinational Corporations in the 1980s*. MIT Press.

Aliber, Z. R. (1983). A Theory of Direct Foreign Direct Investment. In C.P. Kindleberger (Ed.), *The International Corporation A Symposium.* Cambridge: MIT Press. (originally published in 1970)

Anwar, S., & Nguyen, L. P. (2010). Foreign Direct Investment and Economic Growth in Vietnam. *Asia Pacific Business Review*, *16*(1-2), 183–202. doi:10.1080/10438590802511031

Balasubramanyam, V. N., & Sapsford, D. (2007). Does India Need a Lot More FDI? *Economic and Political Weekly*, *42*(17), 1549–1555.

Barrell, R., & Pain, N. (1999). Domestic institutions, agglomerations and foreign direct investment in Europe. *European Economic Review*, *43*(4-6), 925–934. doi:10.1016/S0014-2921(98)00105-6

Calof, J., & Beamish, P. (1995). Adapting to foreign markets: Explaining internationalization. *International Business Review*, *4*(2), 115–131. doi:10.1016/0969-5931(95)00001-G

Carkovic, M., & Levine, R. (2002). Does Foreign Direct Investment Accelerate Economic Growth? Financial Globalization: A Blessing or a Curse (pp. 195-202). Academic Press.

Casson, M. (1983). *The Growth of International Business*. Allen and Unwin.

Caves, R. (1971). International corporations: The Industrial Economics of Foreign Investment. *Economica*, *38*(149), 1. doi:10.2307/2551748

Caves, R. E. (1982). *Multinational Enterprise and Economic Analysis*. Cambridge: Cambridge University Press.

Chandana, C., & Nunnenkamp, P. (2008). Economic Reforms, FDI, and Economic Growth in India: A Sector Level Analysis. *World Development*, *36*(7), 1192–1212. doi:10.1016/j.worlddev.2007.06.014

Chandra, R. (2003). Reinvestigating Export-led Growth in India using a Multivariate Cointegration Framework. *Journal of Developing Areas*, *37*(1), 73–86. doi:10.1353/jda.2004.0005

Cheng, L. K., & Kwang, Y. K. (2000). *What are the Determinants of the Location of Foreign Direct Investment?* The Chinese Experience. *Journal of International Economics*, *51*, 379–400.

Dua, P., & Rashid, A. I. (1998). Foreign Direct Investment and Economic Activity in India. *Indian Economic Review*, *33*(2), 153–168.

Dunning, H. J. H. (1979). Explaining changing patterns of international production: In defence of the eclectic theory. *Oxford Bulletin of Economics and Statistics*, *41*(4), 269–295. doi:10.1111/j.1468-0084.1979.mp41004003.x

Dunning, J. H. (1977). Trade, the location of economic activity and the MNE: A search for an eclectic approach. In B. Ohlin, P. O. Hesselborn, & P. M. Wijkman (Eds.), *The international allocation of economic activity*. London: Macmillan.

Dunning, J. H. (1980). Towards an eclectic theory of international production. *Journal of International Business Studies*, *11*(1). doi:10.1057/palgrave.jibs.8490593

Dunning, J. H. (1981). Explaining the international direct investment position of countries: Towards a dynamic or developmental approach. *Weltwirtschaftliches Archiv*, *119*(1), 30–64. doi:10.1007/BF02696577

Dunning, J. H., & Narula, R. (1996). The investment development path revisited: some emerging issues. In J. Dunning & R. Narula (Eds.), *Foreign Direct Investment and Governments: Catalysts for Economic Restructuring*. London: Routledge.

Dunning, J. H., & Narula, R. (1999). *Foreign Direct Investment and Governments-A Catalyst for Economic Restructuring*. London: Routledge.

Goldar, B., & Rashmi, B. (2007). Impact of Trade Liberalization on Foreign Direct Investment in Indian Industries. *Asia Pacific Research and Training Network on Trade*.

Gould, M. D., Tan, C., & Amir, S. (2014). Attracting Foreign Direct Investment: What can South Asia's Lack of Success Teach Other Developing Countries? *South Asia Economic Journal*, *15*(2), 133–174. doi:10.1177/1391561414548939

Granger, C. (1981). Some Properties of time series data and their use in the econometric model specification. *Journal of Econometrics*, *16*(1), 121–130. doi:10.1016/0304-4076(81)90079-8

Gujarati, D. N., Porter, D. C., & Gunasekar, S. (2009). *Basic Econometrics. Newyork*. Tata: McGraw Hill.

Head, K., Ries, J., & Mayer, T. (2002). Revisiting oligopolistic reaction: Are decisions of foreign direct investment strategic compliments? *Journal of Economics & Management Strategy*, *11*(3), 452–471. doi:10.1162/105864002320272567

Hecksher, E. F. (1949). The effects of foreign trade on the distribution of income. In H.S. Ellish and L.A. Metzler (Eds.), Readings in the theory of international trade. Philadelphia, PA: The Blakiston Company.

Helpman, E., Melitz, J. M., & Yeaple, R. S. (2004). Export Versus FDI with Heterogeneous Firms. *The American Economic Review*, *94*(1), 300–315. doi:10.1257/000282804322970814

Hymer, S. H. (1960). *The International Operations of National Firma: A Study of Direct Foreign Investment*. Cambridge: MIT Press.

Khadaroo, J., & Seetanah, B. (2008). *Transport Infrastructure and Foreign Direct Investment: Lessons from Sub Saharan African Economies*. Wiley Interscience.

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

Kojima, K. (1978, 1982). International Trade and Foreign Direct Investment": Substitutes or Complements. *Hitotsubashi Journal of Economic, 16*, 1-12.

Kumar, K. (1982). Third World multinationals: A growing force in international relations. *International Studies Quarterly*, *26*(3), 397. doi:10.2307/2600427

Kumar, N. (2001). WTO's Emerging Investment Regime: Way Forward for Doha Ministerial Meeting. *Economic and Political Weekly*, *36*(33), 3151–3158.

Kumar, N. (2002). *Globalization and Quality of Foreign Direct Investment*. New Delhi: Oxford University Press.

Kumar, N. (2005). Liberalisation, Foreign Direct Investment Flows and Development. *Economic and Political Weekly*, 1459–1469.

Kumar, N. (2006). 7 Infrastructure Availability, FDI Inflows and their Export-Orientation: A Cross-Country Exploration. *The Indian Economic Journal*, *54*(1), 125.

Lall, S., & Rajneesh, N. (2004). *Understanding FDI assisted Development*. London: Routledge.

MacDougall, G. (1958). The benefits and cost of private foreign investment abroad: A theoretical approach. *The Economic Record*, *36*.

Majeed, M. T., & Ahmad, E. (2007). FDI and Exports in Developing Countries: Theory and Evidence. Pakistan Institute of Development Economics, 46(4), 735-750.

Mody, A. (2007). *Foreign Direct Investment and the World Economy*. London: Routledge. doi:10.4324/9780203966143

Nagaraj, R. (2004). Foreign Direct Investment in India in the 1990s: Trends and Issues. *Economic and Political Weekly*, *38*(17), 1701–1712.

Narula, R. (1996). *Multinational Investment and Economic Structure*. London: Routledge.

Oberhofer, H., & Pfaffermayr, M. (2007). FDI versus exports. Substitutes or complements? A three nation model and empirical evidence. Working Papers in Economics and Statistics.

Ohlin, B. (1933). *Interregional and International Trade*. Cambridge: Harvard University Press.

Patra, S. (2019). FDI, urbanization, and economic growth linkages in India and China. In *Socio-Economic Development: Concepts, Methodologies, Tools, and Applications* (pp. 313–327). Hershey, PA: IGI Global.

Pearce, I., & Rowen, D. C. (1966). A framework for research into the real effects of international capital movements. In T. Baggott (Ed.), *Essays in Honour*. Cambridge: Harvard University Press.

Rahmaddi, R., & Ichihashi, M. (2012). *The Impact of Foreign Direct Investment on Host Country's Exports: Sector-Based Evidence from Indonesian Manufacturing.* Hiroshima: Development Discussion Paper.

Ray, S. (2012). Impact of foreign direct investment on economic growth in India: A co integration analysis. *Advances in Information Technology and Management*, *2*(1), 187–201.

Rugman, A. M. (1981). *Inside the Multinationals: The Economics of Internal Markets*. Newyork: Columbia University Press.

Saltz, I. (1992). The negative correlation between foreign direct investment and economic growth in the third world country: Theory and Evidence. *Rivista Internationale di Scienze Economiche e Commercial*, *7*(39), 617–633.

Seetanah, B., & Khadaroo, A. J. (2007). Foreign direct investment and growth: New evidences from Sub-Saharan Africa. *CSAE*. Retrieved from http://www.csae.ox.ac.uk/conferences/2007-EDiA-LAWBiDC/papers/169-seetanah.pdf

Sharma, K. (2000). Export growth in India: Has FDI played a role?

Teece, D. J. (1981). The Multinational Enterprise: Market Failures and Market Power Considerations. *Sloan Management Review*, *22*, 3–17.

UNCTAD. (2001). World Investment Report.

Vijayakumar, N., Sridharan, P., & Rao, K. C. S. (2010). Determinants of FDI in BRICS Countries: A panel analysis. *International Journal of Business Science & Applied Management*, *5*(3), 1–13.

Wang, M. (2009). Manufacturing FDI and Economic Growth: Evidence from Asian Economies. *Applied Economics*, *41*(8), 991–1002. doi:10.1080/00036840601019059

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. doi:10.1111/j.1465-7287.2001.tb00059.x

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