Does Foreign Direct Investment Effect over Export Growth in Long Run in India: A Co-integration Analysis

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Abstract: Export growth in domestic country is associated with several factors including foreign direct investment that significantly contributes in faster export promotion. Since 1991, the New Economic Policies (NEPs) fetched the uninterrupted foreign investment to India than before. Within this framework, this paper is prepared to measure the effect of FDI inflow over export promotion. Using annual data series from 1991-2012, we investigate the effect of FDI over export growth in India with employing co-integration statics. Results support the Export increases in many folds in long run when FDI comes. However, the causality test reports, there is bi-directional relation which suggest both export and foreign direct investment are motivator factor to each other variable.

Keywords: Bi-directional relation, Causality test, Co-integration statics, Export growth, Foreign investment.

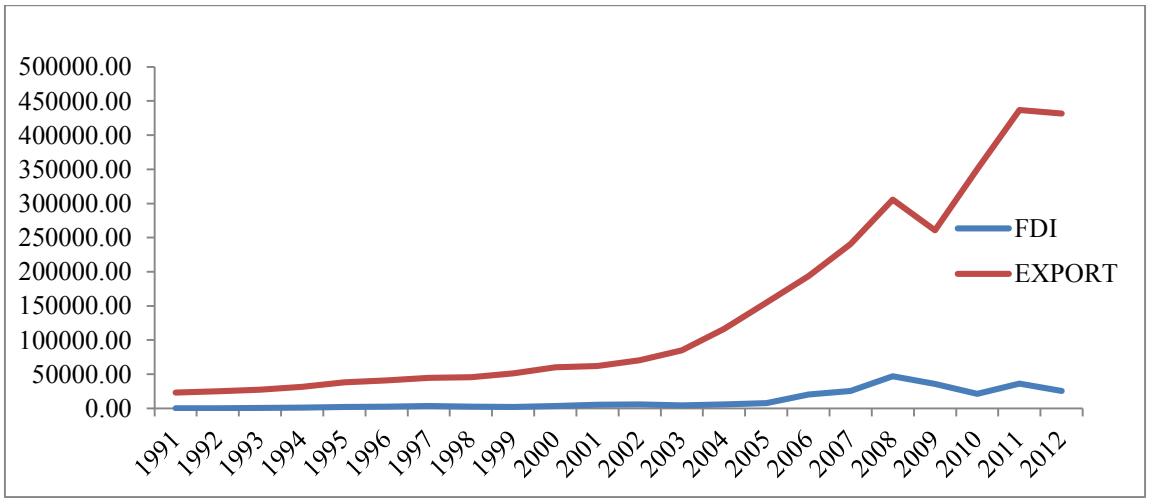
I. Introduction of the Study

Since 1970's decade, the export growth in India is much faster than GDP. For instance, the export growth is 12% and GDP growth is 9.45% during 1970-1998 intervals. Evan earlier, the export growth was much faster during 1945-1995. Several factors are responsible for such unexpected growth including foreign direct investment since 1990s. In 1991, India has opened its economy in terms of framing New Economic Policies (NEPs) and abolishing the tariff and Non-Tariff Barriers (NTBs), therefore economy begun to receive significant inflows that further successfully lead to export growth. In this process, the supportive measures were taken includes to abolish the foreign equity participation limit of 40% as prescribed in FERA Act 1973, liberalizing the import of technology, permitted 24% foreign equity in small units, abolishing the restriction over foreign brand names in domestic firms and reducing corporate tax (Rao and Dhar, 2011). The early effect of liberal policies easily looked over Indian economy that reached to ninth place in order to receive FDI inflows among developing countries in 1997s (World Bank, 1998: 20). Furthermore, the role of FDI is primarily depends upon the motives of investment. The motive may be to capture the domestic market or may be take over the advantages possess in host country. Here the first motive clearly defines the adverse effect of FDI whereas the investment utilizes the competitive capabilities surely lead to export growth in many folds. Hymer (1978) raised the questions in his doctoral thesis that why foreign based firms prefer to invest in specific location and he answered they want to exploit or get monopoly over advantages possess in recipient country. The country may possess with favorable factors such as advance technology, managerial know-how. Dunning (1973) identified the determinants influence largely the foreign companies to invest such as suitable locational advantages, cost component, favorable investment climate e.g. market forces are easily available. He further suggested the companies highly prefer the locational advantages where less transportation as well as labor cost lead to decrease the final cost available to consumer.

This paper is a specific effort in the area of investment effects in order to measure the co-integration between FDI inflows and export growth in India from 1991 to 2012. The rest of the paper is divided into sections to observe the basis of this research idea. In this sequence, section II discuss about the trends of FDI inflow and export in India using line graph. Section III presents the review of past studies to get a robust research gap in order to make this study more relevant. Section IV displays the detailed methodology with equations to reject the null hypothesis. Section V, represents the empirical results produced using ADF statistics. Last not least in section VI about conclusion and some of the recommendation have suggested for further course of action.

II. Trends of FDI Inflow and Export Growth in India

Before testing the hypothesis to prove the integration between FDI and Export growth, this section exhibits the descriptive analysis of both supportive economic indicators in order to frame effective strategies for further Augment Dickey Fuller (ADF) statistics.



Source: Data compiled from UNCTAD online database.

Fig. 1: Trends of FDI and Export in India from 1991 to 2012

Foreign direct investment is considered as one of major source of finance that does not support only to provide the funds but assists to make best techno-crate and provide managerial skills in regards of employment generation and export promotion. However, the capital arrival ratios since post-independence were largely restricted to licensing agreement that caused to slow movement of external funds in economy. Since 1991, FDI inflow has recorded much faster growth than 1950-1990. Statistically, it was around US $75 Million in 1991 and rose steeply to US$ 46553 Million in 2011-2012 (UNCTAD, 2012). Initially, the effect of new economic policies clearly observed till 1998 when uninterrupted FDI inflows fetched to India. From 1998, the scale of foreign investment reduced couple of year caused to several factors includes East Asian currency crisis and Pokhran test carried by India to couple of year. From 2003 to 2008, the progression held-up speed and begun to receive highest growth in volume of FDI inflow. Several factors were responsible for such unexpected turn in the trend of FDI in India which includes recovery in industrial growth, reshuffling investment policies and allowed FDI through automatic route upto 100% along with enactment of SEZ Act 2005. In third quarter of year 2008, the US subprime crisis dumped the world economy that lead to reduce the for flow to couple of years. However, India was least affected country still the scale of FDI reduced due to global inflationary pressure. Meanwhile, china has recorded about 17.45% of cumulative developing countries whereas India has recorded 6.69% during 2008 (Pradhan, 2010). On the other hand, data statics for export shows US$ 23020.36 Million in 1991 and it moved to US$ 431914.39 Million in 2012. Despite of diverse work force, growth in Export is less as compared to FDI growth since 1991. Low level of infrastructure and poor economic relation with some developed countries restricts the country to export its production to overseas (Srinivasan, 1998).

III. Existing Literature and Discussed Issues

This study is basically conducted to analyze the role of FDI inflow in export promotion since 1991 to 2012. Before going into depth, vast literature available in this concern has been studied and compiled the facts produced by existing authors during different time interval. This section has interpreted the previous studies on the basis of time period i.e. up to 1999 and from 2000 to 2012.

A. Review of Past Studies Period Upto 1999

Several authors have worked empirically during this period and produced the thought that FDI is one of prominent source of external finance that support in rapid export promotion. In this process, Solow (1956) examined the trends of growth is interconnected with entrance of FDI in association of technical growth and availability of labor forces. He stated both factors are directly co-related with income. On contrary, he advocated the non-existence of technical progress and labor force cause to harm in long run growth. Barro Robert J. (1991) highlighted the role of FDI in the Process of Industrialization and economic growth in developing countries. Most of the countries in the World have recognized that FDI by Transactional Corporation (TNC) contribute in many ways to the process of economic growth of host countries. Lucas (1993) analyzed FDI determinants in East and Southeast Asian countries during 1960-1987. He observed the demand of FDI inflow in export markets is more elastic. He also criticized the studies focused to local market size and omits export markets as a determinant of FDI. Singh and Jun (1995) found export orientation is the robust variable for attracting FDI. Dua and Rashid (1998) they concluded with implication that FDI contributes in GDP and trade growth in long run whereas the significance in short run is unaffected.

B. Review of Past Studies Period From 2000 to 2010

At the end of previous decade, the East Asian currency crisis and US restriction over Indian companies somewhere reduced the continuous process of foreign investment in India. However, the country reached to ninth position among developing countries in order to receive maximum FDI inflows in 1997. During this decade, the effect of FDI for domestic economy also studied by many researchers. In this process, Noor Bakhsh, Paloni and Youssef (2001) emphasized more on non-traditional determinants of FDI in regard to trade-related variables in developing countries. They focused the role of human capital in order to receive the FDI spillover and concluded the facts in reference of t statistics that this factor is positively associated with FDI inflow. Laura Alfaro (2003) examined the sectoral trend of FDI flow in primary, manufacturing, and services sectors to count the different effects on economic growth. He highlighted the role of FDI inflow into primary sector that have a negative effect on growth, whereas FDI inflow in the manufacturing sector a positive one and impact over service sector is ambiguous. Carstensen and Toubal (2004) conducted study over South Asian countries and observed the traditional determinants such as market potential, low costs labor, skilled workforce and relative endowments had significant effect on growth prospect of South Asian countries. In addition, factors like level and method of privatization and country risk also play vital role. Quattara (2005) stated the public investment and real income are such determinants that have positive influence over level of private investments in Senegal while the credit to private sector and terms of trade are such which negatively associated with private investment. Sahoo (2006) has conducted a panel co-integration teston FDI determinant such as market size, labor force growth, infrastructure index, trade openness in South Asia and produced that FDI and its determinants have long run relationship in south Asian countries. Jyun-Yi, Wu and Hsu Chin-Chiang (2008) conducted an empirical study to examine the effect of FDIs over economic growth using determinants such as initial GDP and human capital and observed FDI alone play a significant role in economic acceleration. The authors further argued; FDI is observed to have a positive and significant impact on growth only if host countries have better level of initial GDP and human capital. Muhammad Zahid Awan et al. (2010) FDI is considered as a vital source of external capital flows to meet saving-investment gap and export import gap in Pakistan's economy from 1971 to 2008. They concluded, debt servicing and GDP found to be statistically insignificant impact on FDI inflows into Pakistan. Amit Saini et al. (2012) discussed the effect of FDI over SAARC economies using GLM model. They claimed, FDI has strong positive relationship with GDP and export whereas financial strength is negatively correlated since post liberalization.

IV. Data and Methodology

The annual time series data for FDI and Export were used to exhibit the long run effect of variables. For this purpose data has been collected from renowned reliable sources such as world bank indicators UNCTAD online data base, SIA annual newsletter over the period from 1991-2012. Primarily the purpose of this study is to investigate the co-integration between FDI inflow and export growth of India. For this, we applied the granger causality test to predict the direction which is developed by (Granger, 1969, 1988). Moreover, the long run effect using co-integration statistics between FDI and export growth is estimated which was developed by (Johnson, 1988 and Juselius, 1990). In order to perform the causality and co-integration statics, need to develop stochastic structure of time series data. For this purpose, Augmented Dickey Fuller (ADF, 1979) test has been employed to determine the stationary structure of time series data.

A. Unit Root Test

Following the study of Seddighi et al. (2008), ADF test is used to ascertain that the time series must be stationary at level or integration of I(d).

$$D = (1,2,\ldots n)$$

The properties of non-stationary data represent the mean value moves around the trend which create the disturbance in relationship among dependent and independent variables and inference leading to spurious regression.

The mean value of stationary data series remain far from trend don't depend upon time which further support to prove the reliability of co-integration test and granger causality statics.

$$\Delta Y_t = \mu + \gamma Y_{t-1} + \sum_{j=1}^{p} \alpha_j \Delta Y_{t-j} + \beta t + \omega_t \qquad (1)$$

Where Y_t=Y_t-Y_{t-1} and Y are the variables used in the study, ω is stochastic error. The number of legs used to minimize the problem of auto correlation chosen from Akaiki information criterion (AIC). The hypothesis framed for study is discussed below.

H_0: Variables contain unit root problem at 5% level of significance.

H_1: Variables does not contain unit root problem at 5% level of significance.

B. Co-integration Test

This test is basically used to determine the existence of long run relationship among variables. In order to perform this statics, the series must be stationary to produce more realistic results. The hypothesis framed for study is discussed below.

$H_{0:}$ There are non- co-integration variables.

$H_{1:}$ There is co-integration among variables.

The Johnson (1988) proposed two statistics to determine the co-integration i.e. λ_{trace} and λ_{max} statistics

$$Y_t = A_1 y_{\epsilon-1} + \ldots + A_P Y_{t-p} + B\chi_t + ut \quad (2)$$

Where y_t is a *k*-vector of I (1) variables, x_t is a n-vector of deterministic trends, and u_t is a vector of shocks.

C. Granger Causality Test

This test is used to determine the direction of casual relationship between FDI and Export. This test is powerful and simplest tool to exhibit the casual relationship (Granger, 1986).

$$\Delta FDI_t = \beta_0 + \Sigma\beta_{1i}\Delta FDI_{t-1} + \Sigma\beta_{2i}\Delta Export_{t-i} + \alpha 1 Z_{t-1} + \delta_{1t} \quad (3)$$

$$\Delta Export_t = Ó_0 + \Sigma Ó\, i_{1i}\Delta Export_{t-1} + \Sigma Ó_{2i}\Delta FDI_{t-1} + \lambda_1 Z_{t-1} + \delta_{2t} \quad (4)$$

Z_{t-1} is the error correction term obtained through co-integration equation.

$H_{0:}$ FDI does not granger cause to Export, if Fc is less than critical value of F

$H_{1:}$ FDI does granger cause to Export, if Fc is more than critical value of F

and

$H_{0:}$ Export does not granger cause to FDI, if Fc is less than critical value of F

$H_{1:}$ Export does granger cause to FDI, if Fc is more than critical value of F

V. Empirical Results and Discussion

Table I exhibits the results produced through unit root statics based on Augmented Dickey Fuller test (ADF). The author has checked the properties of data using both level and Ist difference in order to determine the value of t statics at constant.

The purpose is to make the data series stationary to get the reliable results. The test reports the null hypothesis (H_0) cannot be rejected at level i.e. consist the unit root problem. However, the integration order at Ist difference I (1) clearly presents the statics is stationary for FDI and export both indicators. We therefore claim the H_0 is rejected at I (1). Thus, these variables would be helpful to produce more reliable results during co-integration test.

Table II shows the results prepared using Johnson co-integration test for explaining the long run relationship between FDI and Export over study period 1991-2012. Before moving to co-integration test, results also compiled using ADF statics in order to ascertain the data must be stationary at I (1) to remove any spurious results.

The co-integration is based on maximum likelihood estimate of VAR at 0 or 1. The above results presents the trace value is 67.797 which is greater than 5% level of significance 15.495. Moving onto null hypothesis at most I represent the trace statics 11.109 at 5% critical value 3.8414. Similarly, the max-Eigen value 56.688 which is greater than 5% critical value 14.265 and for at most 11.109 which is greater 5% critical value 3.8414. Based on these analysis, we can predict the variables are co-integrated to each other i.e. they have long run equilibrium.

Table I: Stationary Test Statistics

Variable	ADF	Critical value*			p value*	Null Hypothesis**
	t value	1%	5%	10%		
FDI (At Level)	-1.2634	-3.788	-3.0123	-2.6961	0.6263	Accepted
FDI***	-5.2022	-3.829	-3.0289	-2.6047	0.0005	Rejected
Export (At Level)	2.1075	-3.8085	-3.0206	-2.6504	0.9999	Accepted
Export***	-4.1449	-3.8495	-3.0372	-2.559	0.0049	Rejected

* Mackinnon critical value, ADF Augmented Dickey Fuller statistics,** Null hypothesis: The series has a unit root or non-stationary problem,*** First difference.

Table II: Johnson and Juselious Co-Integration Test (FDI and Export)

H_0	H_1	Test statics	5%	1%	p value**
λ_{trace}		λ_{trace}			
r=0	r>0	67.797	15.495	19.937	0.0000
r≤1	r>1	11.109	3.8414	6.6348	0.0009
λ_{max}		λ_{max}			
r=0	r=1	56.688	14.265	18.52	0.0000
r=1	r=2	11.109	3.8414	6.6348	0.0009

** Mackinnon-Haug-Michelis (1999) p value

TABLE III: GRANGER CAUSALITY TEST

	Null Hypothesis (H_0)	F statistics	P value*	Result	Relationship
H_1	Export does not granger cause to FDI inflow	5.6792	0.0146	Rejected	Bi-directional
H_2	FDI Inflow does not granger cause to Export	9.1838	0.0025	Rejected	

Sample period 1991-2012
Lags chosen 2
*5% level of significance

The Table III shows, for H_1 the p value is 0.0146 which is less than 5% significance value. Therefore, we reject the null-hypothesis means Export does granger cause to FDI inflow. For hypothesis H_2, p value is 0.0025 which is less than 5% level of significance value. Therefore, we reject the null hypothesis that explains FDI inflow does granger cause to export growth in India. Thus, it can be interpreted the variables FDI and export reveals the presence of causal relationship which suggests the bi-directional relationship exists in these two variables.

VI. CONCLUSION

In this research, testing of hypothesis explained that FDI inflow is positively related to the export growth in India. On the basis of results interpreted, the report suggest, the government need to re-shuffle economic policies to increase the scale of FDI to commensurate with china's FDI inflow that would proportionate .the export growth in many folds. Moreover, this act would surely support to develop the new market for Indian export and would be more helpful to build up the foreign exchange reserve. During past two decades, FDI has developed as one of pro-active source of foreign funding's along with support to provide the best technologies and managerial skills to make our country more sustainable in long run. Despite these favorable factors, we investigated the effect of FDI inflow over export growth. The results reports, there is long-run relationship exists between FDI and export and granger causality test report the existence of bi-directional relationship between the variables during study period 1991-2012. Thus, the study claims the trends of FDI inflow helps to accomplish the domestic requirement with rapid export promotion in long run.

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