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CAUSAL RELATIONSHIP BETWEEN FDI INFLOWS AND SERVICES EXPORT- A CASE OF INDIA

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ABSTRACT

An attempt is made to study the possible link among FDI inflows and services export of India the post-liberalization period 1990-91 Q1 to 2007-08 Q4. The long-term relationships among the variables are analysed using the Johansen and Juselius multivariate cointegration approach. Short and long run dynamics are captured through vector error correction models. There is evidence of cointegration among the variables, indicating that a long- term relationship exists among them. An unidirectional causality is observed from FDI inflows to services export. Regression Analysis is also done for the time period 1991 to 2008, which reveals that FDI inflows in the services sector, consultancy services, transport services influences services export.

This study has tried to narrow the gap that exists in the research literature in this field.

INTRODUCTION

The share of developing countries in world FDI inflows has increased from 17% in 1985-90 to about 26% during 1997-2002 and was about 36% in 2005(WIR, 2005).In terms of FDI as a percentage of gross fixed capital formation , the share rose up from 8% in 1985-90 to 12.6% during 1997-02.(*UNCTAD*, 2003).The share in the world total of FDI inflows to the services sectors in developing countries climbed from 35% in 1990 to more than 50% in 2007. So a massive surge of Foreign Direct Investment (FDI) inflows into developing countries during the past two decades has been observed. FDI is widely viewed as being one of the principal vehicles for the international transfer of technology. FDI results in increase in productive capital stock, technological growth, and facilitates transfer of managerial skills, besides improving global market access. Some commonly observed growth impact of FDI inflows have been well documented in recent studies (*De Mello*, 1996; *Borensztein, et. al*, 1998, *Balasubramanyam*, 1999). In fact, the significant impact of these flows on export expansion, particularly in East Asian economies before the crisis of 1997-98, has generated a keen interest in exploring the linkages between FDI and exports.

The dynamics of the relationship between FDI and exports is far more complex in case of the Indian economy, which has a large domestic market size (population of 1.138 billion in 2007-08) and was initiated to market-oriented reforms about a decade later, when compared to other developing economies in East Asia. Some of the notable features for the Indian economy are as follows: (a) India has a growing developing market economy and is on the way to become the third largest economy of the world in PPP terms (b) The economy continues to have a relatively higher tariff structure in spite of substantial cut-down on tariff barriers in recent years. Average applied tariff rates have declined significantly from 113% in 1991, prior to Indian economic liberalization, to approximately 34% in 2007. Indian policy makers have progressively committed to reduce its tariff levels to 10-12% within a time span of about 3-5 years (*Sen et al.*, 2004); (c) The Indian economy is still beset with infrastructure bottlenecks in spite of a thriving IT and skilled manpower in its service sector; (d) In spite of economic reforms, the Indian economy remains "mixed" in character, relying significantly on agricultural activities for its growth on one hand, while increasingly moving towards a knowledge-based service oriented economy on the other.

It was noted by *Dunning* (1993) that FDI opens up an important channel for cross-border intra-firm trade in value-adding activities and firms typically engage in intra-firm trade because they find it more efficient to do business within firms than externally through the market. The corporate strategy of network formation to promote the internationalisation of activities is supported by FDI that integrates production vertically and horizontally. Here *Porter's* (1985) generic value

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chain model helps to explain the increasing importance and changing pattern of inter- and intra-firm investment and trade relationships. It is unusual that one single firm performs all the core activities (e.g., research and development, production, marketing, delivery, and provision of after-sale services) and supporting activities (e.g., procurement of inputs, technology, human resources, and other infrastructure; like management and finance) by itself. Some of these activities can readily be performed cheaper or better by suppliers located elsewhere, which can lead to the determination of cross-border transaction flows in intermediate goods and services by multinational hierarchies (*Dunning*, 1993).

REVIEW OF LITERATURE

The impact of foreign direct investment on exports is not straightforward and varies across countries, industries and over time, depending on wide range of factors both for home and host countries. Thus, whether FDI substitutes trade (serves as alternative means of supplying foreign markets) or complements trade (facilitates exports of host country) depends critically on the motives of the foreign investor, type of industries (industry-mix) and the nature of investment undertaken (*Kojima*, 1973; *Dunning*, 1988; *Kumar*, 1998; *Athukorala et al.*, 1995). The linkages between FDI and services trade have been progressively consolidated with the globalisation of business operations (*Hardin* and *Holmes*, 1997, *Markusen et al.*, 1999 and *Dee*, 2001). *Ethier* and *Horn* (1991) noted that internationally traded services are often customized to accommodate the needs of individual purchasers while *Markusen et al.* (1999) identified special attributes of services delivered via FDI.

The initiation of reforms after liberalization has geared the economic policies of the country towards an export oriented growth strategy, with FDI inflows playing a major role (*Rajen* and *Sen*, 2002). Although some empirical studies have supported the view that FDI inflows in India is not of the export-oriented type (*Aggarwal* (2001); *Sharma* (2000)), it is important to note that none of them studied the impact of FDI inflows on services export in India, in spite of the service sector being an important engine of growth, and services trade being increasing in importance for the Indian economy in recent decades (*Rajan* and *Sen* (2002); *Sen* (2002); *Asher* and *Rajan* (1995); *Patibandla* (2001)). Thus, most empirical studies to date, have largely examined the impact of FDI on trade in manufacturing sector neglecting the services sector. In fact, a recent study by *Welsum* (2003) stresses that given the peculiarities of the nature of services trade, the impact of FDI on services trade could be different as compared to its impact on trade in manufacturing goods. *Wong* and *Tang* (2007) empirically confirmed for Malaysia the existence of bi-directional causality between inward FDI and semiconductor exports.

Notwithstanding the wide-ranging FDI-services and extensive trade-and-services linkages, there is relatively little empirical work examining the possible relationships between FDI and services export. On the other hand, the causal relationships between FDI and commodity export have been studied and documented extensively. So, an attempt is made to study the causal relationship between FDI inflows and services export during the post liberalization period.

Data Source

The data used in this study is the foreign direct investment (FDI) inflows in India quarter wise covering the period from 1990-91 Q1 to 2007-08 Q4 (**Figure1**). Services Export (SEREXP) is also taken for the same time period and the data is extracted from Reserve Bank's *Handbook of Statistics*. However annual data of FDI inflows in the services sub sectors and services export for the time period 1991 to 2008 are also considered for the purpose of regression analysis.

METHODOLOGY

- Econometric Analysis
- Regression Analysis

Econometric Analysis

Granger-causality test in a bivariate VAR framework is used to examine causality between FDI inflows and services export for the time period 1990-91 Q1 to 2007-08 Q4.

Tests for Stationarity

To test the stationarity of the variables Augmented Dickey Fuller (ADF) [1979], Phillips-Perron (PP)[1988] and Kwiatkowski, Phillips, Schmidt and Shin [1992]tests are performed.

Tests for Cointegration

After examining the stationarity of the variables involved in the study, an attempt is made to figure out the level of cointegration between the examined variables, i.e., those tied in a long-run relationship. Cointegration Test is conducted to determine the long-run economic relationship between the variables (Thomas, 1993). In this study, the Error-correction Cointegration technique of Johansen (1988) and Johansen and Juselius (1990) has been applied to identify the cointegration relationship between the variables. Johansen and Juselius' (1990) approach to the number of co-integrating vectors is applicable only if two variables are I(1). The Cointegration Test of maximum likelihood (based on the Johansen-Juselius Test) has been developed based on a VAR approach initiated by Johansen (1988). According to Johansen (1988), a p-dimensional VAR model, involving up to k-lags, can be specified as below.

$$Z_t = \alpha + \Pi_1 Z_{t-1} + \Pi_2 Z_{t-2} + \ldots\ldots\ldots\Pi_k Z_{t-k} + \varepsilon_t \quad \ldots(1)$$

where is a vector of potential endogenous variables and each of the is a matrix of parameters and is the white noise term. Equation (1) can be formulated into an Error Correction Model (ECM) form as below.

$$\Delta Z_t = \alpha + \Pi_k Z_{t-k} + \sum_{i=1}^{k-1} \theta_i \Delta Z_{t-i} + \varepsilon_t \quad \ldots(2)$$

where is the first difference operator, and and are by matrices of unknown parameters and is the order of the VAR translated into a lag of in the ECM and is the white noise term. is a vector which represents a matrix of long-run coefficients and it is of paramount interest. The long-run coefficients are defined as multiples of two vectors, and , and hence , where is a vector of the loading matrices and denotes the speed of adjustment from disequilibrium, while is a matrix of long-run coefficients so that the term in equation (2) represents up to cointegration relationships in the Cointegration Model. Evidence of the existence of cointegration is the same as evidence of the rank ( ) for the matrix. Johansen and Juselius (1990) have shown that the rank of r of in equation (2) is equal to the number of cointegrating vectors in the system. It has full rank, i.e., and it is said that there are cointegrating relationships and that all variables are I(0). Cointegrated variables share common stochastic and deterministic trends and tend to move together through time in a stationary manner even if the two variables in the study are non-stationary. There are three possible cases.

1. The rank of can be zero. This takes place when all the elements in the matrix are zero. This means that the sequences are unit root processes and there is no cointegration. The variables do not share common trends or move together over time. In this case, the appropriate model is a VAR in first differences involving no long-run elements.

2. The rank of could be full. In this case, the system is stationary and the two variables can be modelled by VAR in levels. In the present study, if , then all the components of are I(0) rather than I(1) or I(2) and the cointegration analysis is irrelevant.

3. Finally, the rank of can be reduced [ ]. In this case, even if all the variables are individually I(1), the level-based long-run component would be stationary. In this case, there are ( ) cointegrating vectors. The appropriate modelling methodology here is the Vector-Error Correction Model (VECM).

Johansen and Juselius (1990) have developed two Likelihood Ratio Tests. The first test is the Likelihood Ratio Test based on the maximal Eigen value which evaluates the null hypothesis of 'r' cointegrating vector(s) against the alternative of 'r+1' cointegrating vectors. The second test is the Likelihood Ratio Test based on the Trace Test which evaluates the null hypothesis of, at most, 'r' cointegrating vector(s) against the alternative hypothesis of more than 'r' cointegrating vectors. If the two variables are I(1), but cointegrated, the Granger Causality Test will be applied in the framework of ECM in which long-run components of the variables obey equilibrium constraints while the short-run components have a flexible dynamic specification.

Tests for Granger Causality with VECM

In order to examine the causal linkages between the variables, the Granger Causality Test has been conducted. The direction of the impact of each of the variables is also determined from the analysis. In order to capture the impact of variables observed in the past time period in explaining the future performance, the optimal lag length p (which is 3 in the present study) is chosen (see Table 1) and the criteria used in selecting the VAR model and optimal lag length require the combination of information criterion (minimum of AIC or SBIC or HQIC or FPE value). The above selection criteria would guarantee that neither too short lag length is chosen to result in serially correlated errors nor too many lags are included that might induce specification bias for having inefficient parameters (Hendry and Mizon, 1993).

If the variables contain cointegrating vector, causality exists in at least one direction. According to Engle and Granger (1987), if two series, say X and Y, are integrated of order one [i.e., I(1)] and cointegrated, then there is possibility of a causal relationship in at least one direction. The direction of a causal relationship can be detected in the VECM. Engel and Granger (1987) have found that, in the presence of cointegration, there always exists a corresponding error-correction representation, captured by the error-correction term (ECT). This means that changes in the dependent variable are a function of the level of disequilibrium in the cointegrating relationship as well as changes in other explanatory variable(s). The ECT captures the long-run adjustment of cointegration variables. As such, in addition to the direction of causality, the incorporation of ECT in the VECM allows to detect both short- and long-run causal relationships between the variables. On the other hand, if no cointegrating vector exists in the model, the standard VAR should be applied to test the causal relationship between variables. As the prerequisite of causality testing, it is necessary to check the cointegrating properties of the variables, and, to examine the causal linkages, a VECM is specified, which can be expressed as follows:

$$\Delta LnFDI_t = \sum_{j=1}^{p-1} \beta_{11,j} \Delta LnFDI_{t-j} + \sum_{j=1}^{p-1} \beta_{12,j} \Delta LnSEREXP_{t-j} + \alpha_1 ECT_{t-1} + \varepsilon_{1t} \quad \ldots(3)$$

$$\Delta LnSEREXP_t = \sum_{j=1}^{p-1} \beta_{21,j} \Delta LnSEREXP_{t-j} + \sum_{j=1}^{p-1} \beta_{22,j} \Delta LnFDI_{t-j} + \alpha_2 ECT_{t-2} + \varepsilon_{2t} \quad \ldots(4)$$

where is the first difference operator and and are white noise. ECT is the error correction term, and p is the order of the VAR, which is translated to lag of in the ECM. and represent the speed of adjustment after the FDI inflows and Services export deviate from the long run equilibrium in period t-1. The coefficients of lagged value, for in equation (3) represent short run effects of Services Export on FDI inflows; and, the coefficients of lagged for in equation (4) represent short run effects of FDI inflows on Services export.

Regression Analysis

The regression equation for the first model is as follows:

$$LnSEREXP = \alpha_1 + \beta_1 LnFDISER + \varepsilon_1 \quad \ldots(5)$$

where is the constant term, LnSEREXP represents logarithmic value of services export, LnFDISER represents logarithmic value of FDI inflows in the services sector, is the coefficient to be estimated and is the error term.

The linear regression equation for the second model is:-

$$LnSEREXP = \alpha_2 + \beta_1 LnSERCON + \beta_2 LnTRANSPORT + \beta_3 LnOTHERS + \varepsilon_2 \quad \ldots(6)$$

is the constant term, LnSERCON is the logarithmic value of FDI inflows in services sector (public administration, business and legal services, financial, banking and insurance, personal, community and other services) and consultancy services, LnTRANSPORT is the logarithmic value of FDI inflows in transport services, LnOTHERS is the logarithmic value of FDI inflows in other services sector(telecommunication, hotel tourism and trading). are the coefficients to be estimated. is the error term.

DATA ANALYSIS

Econometric Analysis

Time Series Properties of the Variables

Table 2 report the results of Augmented Dickey Fuller (ADF) Phillip Perron (PP) test and KPSS test of unit root by lag length chosen based on minimum values of Schwartz criterion (SC). The tests are performed on both the level and first differences of the logged variables.

According to the three tests conducted it is found that logarithmic values of FDI is stationary in the first difference form according to ADF test, Phillip Perron test and KPSS test. The variable SEREXP is stationary in the first difference form according to ADF test, Phillip Perron test and KPSS test.

Johansen Co integration Test

Johansen Cointegration Test results for the cointegration rank r have been presented in Table 3. Going by the results of the ADF, PP Test and the KPSS Test, it has been observed that the variables have the same order of integration, i.e., I(1) and the Johansen Cointegration Test has been employed to find out the cointegration rank and the number of cointegrating vectors. The null hypothesis is rejected in the cases of both the Trace statistic and Max-Eigen value statistic. The null hypothesis of (i.e., there is no cointegration) is rejected against the alternative hypothesis of at 5% level of significance in case of the Max-Eigen value statistic. Similarly, going by the result of the Trace statistic, the null hypothesis of is rejected against the alternative hypothesis of at 5% level of significance. Table 3 shows that the number of statistically significant cointegration vectors is equal to one for the Trace statistic and also for the Max-Eigen value statistic. The results suggest that there is a long-run relationship among FDI inflows and Services export for the period of the study.

Analysis of VECM

Johansen's and statistics (as per Table 3) reveal that the variables under study stand in a long-run relationship between them, thus justifying the use of ECM for showing short-run dynamics. Going by the definition of cointegration, the Granger Representation Theorem (Engle and Granger, 1987) states that if a set of variables is cointegrated, then there exists valid error correction representations of the data.

In Table 4 below, the cointegrating equations are given along with the equation for changes in FDI inflows (first column), changes in Services export (second column). The coefficients of Error Correction Term contain information about whether the past values affect the current values of the variable under study. A significant coefficient implies that past equilibrium errors play a role in determining the current outcomes. The information obtained from the ECM is related to the speed of adjustment of the system towards long-run equilibrium. The short-run dynamics are captured through the individual coefficients of the difference terms. The adjustment coefficient on in equation (3) is negative and statistically significant at 1% level of significance indicating that, when deviating from the long-term equilibrium, error correction term has an opposite adjustment effect and the deviation degree is reduced. The significant error term also supports the existence of long-term relationship between Services export and FDI inflows. The adjustment coefficient on in equation (4) is negative and statistically significant at 1% level of significance indicating that, when deviating from the long-term equilibrium, error correction term has an opposite adjustment effect and the deviation degree is reduced. The significant error term also supports the existence of long-term relationship between FDI inflows and Services export. The lagged coefficient of is negative and statistically significant at the 5% level of significance, implying that higher FDI inflows has a negative impact on services export in the short run.

Causality test with VECM

Since the variables are cointegrated, the Granger causality test is conducted in the VECM framework and the result is reported in Table 5.The existence of cointegration implies that there must be Granger causality at least in one direction, although it does not indicate the direction of causality among the variables in the estimation

The null hypothesis that "LnSEREXP does not Granger cause LnFDI' is tested using change in FDI inflows (LnFDI) and change in services export (LnSEREXP), when both are stationary in their first difference form in Standard Granger causality regression. The null hypothesis is accepted or rejected based on "chi-squared test based on Wald criterion" to determine the joint significance of the restrictions under the null hypothesis. If the null hypothesis is rejected, one concludes that LnSEREXP Granger causes LnFDI. The lag length is justified by a minimum Final Prediction error (FPE), Schwarz Information Criterion (SIC) and likelihood ratio test statistics. The test result suggests lag order of 3 as optimal lag.(Table 1)

The p value (0.6927) (Table 5) indicates that the coefficients of LnSEREXP are jointly zero in the equation for LnFDI. In this case the null hypothesis that services export does not Granger cause FDI inflows cannot be rejected. The null hypothesis that "LnFDI does not Granger cause LnSEREX" is tested using the logarithmic value of both the variables, in their first difference form. The small p value (0.0678) in Table 5 indicates that the coefficients of the lags of LnFDI are not jointly zero in the equation for LnSEREXP, indicating that the evidence favours the alternative hypothesis that LnFDI Granger causes LnSEREXP. Here it is seen that their is presence of unidirectional causality from FDI inflows to services export and there is no causality running from services export to FDI inflows.

Regression Analysis

The regression results in Table 6 shows that FDI inflows in the services sector as a whole is significant at 1% level of significance in explaining services export in India during the period 1991 to 2008(calendar year wise). The value of 0.717715 is significant in explaining measurement of goodness of fit of the regression model. Table 7 reveals that FDI inflows in the service sector (which includes public administration, business and legal services, financial, banking and insurance, personal, community and other services) along with consultancy services is significant at 1% level of significance in explaining services export. It is also seen that FDI inflows in the transport sector is significant at 5% level of significance in explaining services export.

CONCLUSION

A positive unidirectional Granger causality from FDI inflows to Services Export indicate that FDI has positively influenced the growth of services export in the Indian economy, after the liberalization period. During the post liberalization period the trade policies undertaken by the government, the changing attitude of the government towards foreign direct investment has increased export opportunities has induced foreign investors to take advantage of India's comparative advantage in the services sector. Since services export is largely driven by information and communication technology, the result also conforms to the findings of Gholami et.al (2004), which established strong causal links between FDI and ICT in many developed countries

[1]Thus, while parts of production that require higher capital- and skill-intensity is likely to be undertaken by capital abundant countries, the assembling of the product, which is a labour intensive activity, is likely to be undertaken by the same firm in a labour-abundant country, viz. India.

(consider this point again). The above implies that rapid advancement in information and communication technology (ICT) in India is likely to generate significant scope for export-oriented services. There is a vast unlimited potential for expansion of services export and India needs to boost its export competitiveness and improve its prospects to become a global player in services trade. Rapid technological revolution and widespread use of the information and communication technology (ICT), international production fragmentation has emerged as a key source of export growth, wherein FDI has played a vital role in international splitting up of the production process within vertically integrated manufacturing industries. Through this process, firms have broken up the production process and moved its constituent activities abroad, producing components as well as locating assembly activities in line with the principle of comparative advantage (Athukorala and Suphachalasai, 2004; Arndt, 2003). Though this has traditionally been observed extensively in commodity trade like garments, footwear, toys, handicrafts etc., it is now being applied intensively to the service sector, in the form of Business Process Outsourcing (BPOs). The areas where BPOs are gaining importance ranges from air transport services, software, banking, to health and education services . It is in this context that causal links between FDI and Services exports merits attention in the Indian case, and provides important policy directions.

The First National Foreign Trade Policy 2004-2009 has explicitly recognized the potential for India to be a hub for export-oriented services. Several specific institutional measures have been proposed such as setting up of an exclusive Services Export Promotion Council to map opportunities for key services in key markets, and setting up of common facility centers for use of professional home based service providers in state and district level towns. There are plans to establish a Free Trade and Warehousing Zone (FTWZs) to create trade related infrastructure to facilitate the import and export of goods and services and permit FDI upto 100% in the development and establishment of these zones. The National Telecom Policy (NTP) of 1994 and 1999 contained major policy initiatives to liberalize the telecom sector to private sector participation. This included opening up the sector to competition in basic services as well as value added services, viz cellular mobile services, radio paging, very small aparture terminals (V-SAT)services, etc. This has led telecommunication technologies, services and market structure for India's telecom sector to change rapidly (Kathuria et al., 2003). Further liberalization of services trade is necessitated in other sectors as well along with proper regulatory framework in place. Barriers for visa restrictions, economic needs tests, as well as sector specific restrictions and selective preferential market access need to be liberalized as well. These measures are likely to spur the growth of India's service exports, not only in ICT services sector, but also in areas related to education, healthcare, consultancy and R & D services, financial, transport and professional services. It would be favourable for India to attract FDI in those industries that have potential to compete internationally and benefiting from more capital inputs flowing in and additional gains from their marketing competence, product-process technology and channels of distribution. This scope is significant and as yet widely untapped in the service sector. Hence, the importance of FDI in export promotion in the services sector in India should be pursued as a long-term policy objective.

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[2] Examples in the Indian context would include ticketing services of Singapore Airlines which is outsourced from India and medical transcription and legal documentation services in the US which are also being outsourced increasingly from India.

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Appendix

Figure 1: Logarithmic values of FDI inflows and Services Export

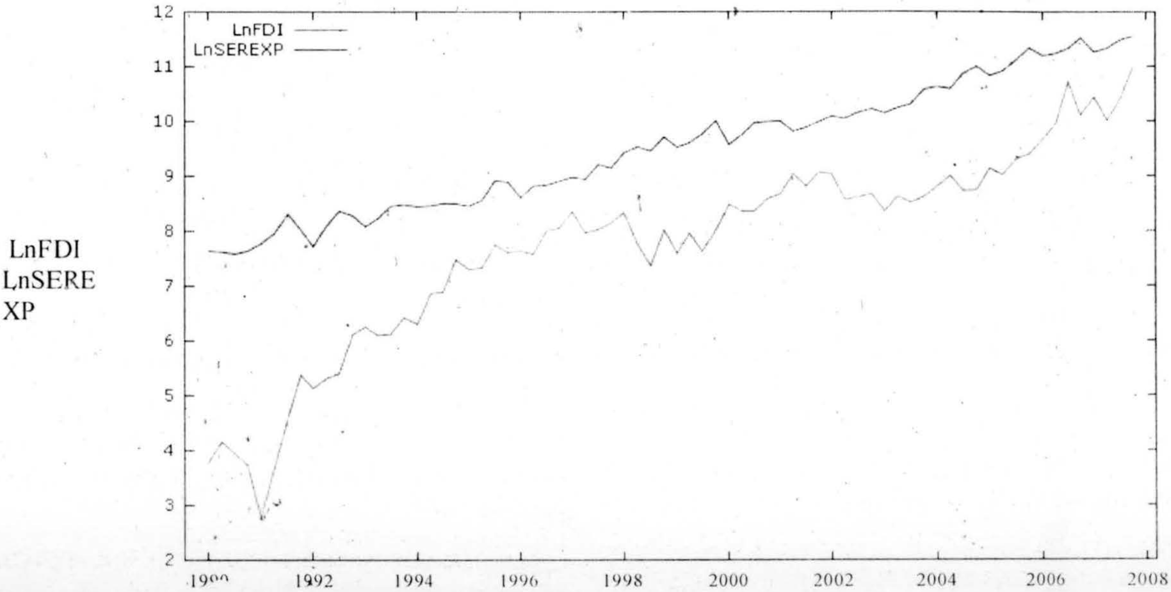

Table 1: VAR Lag Order Selection Criteria (FDI and Services Export) [D.LnFDI and D.LnSEREXP]

VAR Lag Order Selection Criteria						
Lag	**LogL**	**LR**	**FPE**	**AIC**	**SBIC**	**HQIC**
0	-4.201030	NA	0.004114	0.182383	0.247663	0.208249
1	2.134675	12.11238	0.003841	0.113686	0.309525	0.191283
2	15.11978	24.06064	0.002950	-0.150582	0.175816*	-0.021253
3	21.10371	10.73587*	0.002786*	-0.208933*	0.248025	-0.027872*

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SBIC: Schwarz information criterion

HQIC: Hannan-Quinn information criterion

D. indicates first difference of the concerned variable

Table 2: Test of Unit Root Test Hypothesis (1990-91:Q1 to 2007-08:Q4) (without trend)

Series		ADF Statistic		PP Test		KPSS	
		Test Statistic	Lags	Test Statistic	Lags	Test Statistic	Lags
LnFDI	Level	-1.156152	1	-1.294968	1	3.08458***	1
	First Difference	9.795596***	0	9.795596***	0	0.0863623	0
LnSEREXP	Level	-0.151290	3	0.446907	3	1.87883***	3
	First Difference	9.241289***	2	13.50213***	2	0.0346953	2

(a) The critical values are those of McKinnon (1991).

1 % ADF-critical values = -3.527045, 5% ADF-Critical values = -2.903566 10% ADF-Critical values = -2.589227 in case of LnFDI and first difference of LnFDI (logarithmic value of FDI inflows)

1 % ADF-critical values = -3.530030, 5% ADF-Critical values = -2.904848 10% ADF-Critical values = -2.589907 in case of LnSEREXP and first difference of LnSEREXP (logarithmic value of Services export)

1 % PP-critical values = -3.525618, 5% PP -Critical values = -2.902953 10% PP Critical values = - 2.588902 in case of LnSEREXP (logarithmic value of Services export) and LnFDI(logarithmic value of FDI inflows)

1 % PP-critical values = -3.527045, 5% PP -Critical values = -2.903566 10% PP Critical values = - 2.589227 in case of first difference of LnFDI and first difference of LnSEREXP

1 % KPSS- critical values = 0.739,5% KPSS-Critical values = 0.463, 10% KPSS-Critical values = 0.347 in case of LnSEREXP, LnFDI, first difference of LnSEREXP, first difference of LnFDI

(b)***, ** and * represents the rejection of unit root hypothesis at 1%, 5% and 10% levels of significance.

Table 3: Johansen and Juselius Cointegrating Test Results No deterministic trend (restricted constant)

Null Hypothesis	Alternative Hypothesis	Test statistic	0.05 critical value	Probability value*
		Trace statistic		
H_0	H_1			
$r = 0$	$r \geq 1$	48.14486**	20.26184	0.0000
$r \leq 1$	$r \geq 2$	5.515866	9.164546	0.2316
		Maximum Eigen value statistic		
H_0	H_1			
$r = 0$	$r = 1$	42.62900**	15.89210	0.0000
$r \leq 1$	$r = 2$	5.515866	9.164546	0.2316

a) is the number of co integrating vectors.
b) Trace test indicates 1 co integrating equations at 0.05 level.
c) Max-eigenvalue test indicates 1 co integrating equations at 0.05 level.
d) **denotes rejection of the hypothesis at the 0.05 level.
e) *Mackinnon -Haug- Michelis (1999) p-values.

Table 4: Test Results of Vector Error Correction Model

Vector Error Correction Estimates		
Included observations: 68 after adjustments		
Standard errors in ( ) & t-statistics in [ ]		
Cointegrating Eq:	CointEq1	
LnFDI(-1)	1.000000	
LnSEREXP(-1)	-1.097965	
	(0.32953)	
	[-3.33193]	
C	-1.185664	
	(3.19413)	
	[-0.37120]	
Error Correction:	D(LnFDI)	D(LnSEREXP)
CointEq1	-0.039936	-0.042181
	(0.01653)	(0.00616)
	[-2.41599]***	[-6.85140]***
D(LnFDI(-1))	-0.176058	-0.055419
	(0.12373)	(0.04608)
	[-1.42292]	[-1.20259]
D(LnFDI(-2))	-0.002755	-0.109815
	(0.12598)	(0.04692)
	[-0.02187]	[-2.34045]**
D(LnFDI(-3))	-0.246743	-0.061440
	(0.12902)	(0.04805)
	[-1.91246]	[-1.27859]

*** and **denote statistical significance at the 1% and 5% level of significance respectively.

Table 5: VEC Granger Causality/Block Exogeneity Wald Tests. Dependent variable: D(LnFDI)

Excluded	Chi-sq	df	Prob.
D(LnSEREXP)	1.454802	3	0.6927
All	1.454802	3	0.6927

Dependent variable: D(LnSEREXP)

Excluded	Chi-sq	df	Prob.
D(LnFDI)	7.131684	3	.0678*
All	7.131684	3	.0678

D(LnFDI) D(LnSEREXP)

* Rejection of the null hypothesis at 10% level of significance.

Table 6: OLS estimates using for the time period 1991-2008 (18 observations)

	Constant	LnFDISER	R^2	$\bar{R}^2$
LnSEREXP	6.574117*** (0.724013) [9.080106]	0.451778*** (0.070833) [6.378107]	0.717715	0.700072

*** indicates significant at 1% level. Standard errors in ( ) & t-statistics in [ ].

Table 7: OLS estimates using for the time period 1991-2008 (18 observations)

	Constant	LnSERCON	LnTRANSPORT	LnOTHERS	R^2	$\bar{R}^2$	F-statistic
LnSEREXP	4.296386*** (1.183160) [3.631280]	0.467625*** (0.136645) [3.422182]	0.532884** (0.208233) [2.559074]	-0.251619 (0.157274) [-1.599875]	0.830942	0.791928	21.29885 (p-value = 0.000027)

*** indicates significant at 1% level. Standard errors in ( ) & t-statistics in [ ].