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AN EVALUATIN OF FOREIGN DIRECT INVESTMENT AND ECONOMIC GROWTH: A CASUAL RELATIONSHIP

Dinesh Kumar*

Abstract: *Foreign Direct Investment is considered as global economic driver. In 2015, global FDI flows raised its highest level since the global economic and financial crisis of 2008-2009 by 38 percent. Asia is the largest recipient region of FDI inflows in the world but a major part of the FDI inflows are in relatively high income and/ or large economies in the region. In 2015, the four largest FDI recipients are Hong Kong (China), China, Singapore and India. They received more than three quarters of total inflows to developing Asia. The present study is conducted to analyse the determinants of FDI in SAARC region for the duration of 2001 to 2015.The South Asian Association for Regional Cooperation (SAARC) covers the areas of cooperation in agriculture, biotechnology, economic and trade, education, energy, poverty alleviation, science and technology, security aspects etc with the aim at accelerating economic growth and stimulates socio-cultural development in the South Asian Region. FDI has been established itself as a major cartelistic to achieve the higher economic growth in the region since around last two decades. This study is to examine the cause and effect relationship between the various determinants of FDI and economic growth using Granger causality test.*

INTRODUCTION

Foreign direct investment (FDI) plays a significant role in the economic growth around the global economies. It contributes to the economic growth mainly through technological and managerial advancements, increasing return to production via positive externalities, creation of economic climate more competitive and productive spillovers etc. Through investment, it increases the level of employment, income and saving. In this way, it's has been established itself as the major contributor to economic growth to host economies. The South Asian Association for Regional Cooperation (SAARC) covers the areas of cooperation in agriculture, biotechnology, economic and trade, education, energy, poverty alleviation, science and technology, security aspects etc with the aim at accelerating economic growth and stimulates socio-cultural development in the South Asian Region. FDI has been established itself as a major

* Associate Professor, Department of Economics, Ch.Charan Singh University, Meerut, *E-mail: dineshccsu@gmail.com*

cartelistic to achieve the higher economic growth in the region since around last two decades.

Research investigating the determinants of FDI has been increasing along with rising international investment in emerging economies. Most such studies are for one country or two. It is with this background, being motivated by this fact, the present study attempts to examine the determining factors of FDI in the SAARC region during 2001 to 2015 with the following objectives –

i. To understand the status of FDI in selected region.

ii. To identify the determinants of FDI in selected countries.

iii. To investigate the cause and effect relationship between FDI and Economic growth in the selected region.

REVIEW OF LITERATURE

There has been no consensus over the determinants of FDI in recipient economies. There is huge amount of literature available to understand and analyze the issue. To assess the FDI determinants related issue in SAARC countries, the following studies have been reviewed and explored. Srinivasan (2011) investigated the determinants of FDI in selected SAARC countries for the period 1970-2007 employing traditional fixed effects and random effects models. His empirical results indicate that the market size, GDP per capita, trade openness, infrastructure, inflation, degree of risk and uncertainty are the most significant factors in determining FDI in the region. He also finds that other variables such as human capital, degree of industrialization, real exchange rate, domestic investment, and terms of trade are insignificant in attracting FDI in the region. He employs traditional fixed and random effects models for estimation, and does not use panel cointegration methodology.

Basnet and Pradhan (2014) examine the influence of FDI on growth in five SAARC member countries - Bangladesh, India, Nepal, Pakistan, and Sri Lanka. Using time series data from 1990 to 2010, an error correction model is estimated in which growth of real GDP depends on FDI, investment, openness, tax policy, and inflation. Their empirical results indicate that, unlike investment and openness to trade, FDI has not played a significant role in promoting economic growth in these countries. They conclude that the effectiveness of FDI may depend in part on the size of the inflows, as well as the level of economic development. Their sample period is relatively short and they do not utilize the panel data set and panel estimation techniques, just conducting time series analysis.

Saha and Pradhan (2011) examine the determinants of FDI in seven SAARC countries over the period of 1980-2010. Using VAR model, the study resulted that FDI are largely influenced by economic growth, exchange rate, inflation, labor population, trade balance, current account balance and long term debt outstanding. The study concluded that economic growth and exchange rate are bidirectional, while the other

factors are unidirectional on FDI flows. Jun, Sangjoon (2015) examines the effects of foreign direct investment (FDI) on South Asian economies' output growth, utilizing recent panel cointegration testing and estimation techniques. Annual panel data on eight SAARC (South Asian Association for Regional Cooperation) member countries' macroeconomic variables over the period 1960- 2013 are employed in empirical analysis. Using various heterogeneous panel cointegration and panel causality tests, a bi-directional relationship between FDI and growth is found. The study finds evidence for both FDI-led growth and growth-induced FDI hypotheses for the South Asian economies over the sample period. Individual member countries exhibit heterogeneity in terms of the direction or existence of causality subject to their idiosyncratic economic conditions. Among various regressors, FDI, financial development, human capital, and government consumption show the most significant positive effects on output growth. As determinants of FDI, GDP, financial development, human capital, and government consumption are found significant in the region. The bi-directional causality between FDI and growth is found robust to the inclusion of other control variables and using different estimation techniques.

EMPIRICAL ANALYSIS

(a) Data and construction of variables

To examine the determinants of FDI, the study empirically analyze the annual panel data from 2001 to 2015 on eight SAARC (South Asian Association for Regional Cooperation) countries' macroeconomic variables. The eight SAARC nations are Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka. The annual panel data on the SAARC countries' macroeconomic variables are extracted from the World Bank's *World Development Indicators (WDI) 2016*.The variable that are selected for the study are real GDP (RGDP), the labor force (L), the domestic investment share (GCF), foreign direct investment (FDI), domestic credit (DC), inflation (INF), and trade openness (TRAD) . Real GDP is constant at 2010 US dollars. Labor (L) is the total labor force in thousands of persons. The labor force comprises people at ages 15 and older who meet the International Labor Organization definition of the economically active population. The domestic investment share (GCF) is gross capital formation (% of GDP). FDI is foreign direct investment, net inflows (% of GDP). Inflation in consumer prices (annual %) and trade openness (trade/GDP) are used. Frankel and Romer (1999) also use the trade share of GDP as a measure of openness and find a robust positive relationship between openness (the trade share) and income levels. By utilizing economic data series from the same source, *World Development Indicators (WDI)* of the World Bank, comparability of the data across different countries is secured.

(b) Methodology

To examine the determinants of FDI in SAARC countries, the Granger causality test technique is employed (as in , for example, Granger (1988) and Granger (1981). To

Table 1
Description for the selected variables

Series name	*Definition*	*Description*
RGDP	Real Gross Domestic Product	GDP at Market (Constant at 2010US$)
LF	Labor Force	Labor force total
GCF	Investment Ratio	Gross Capital Formation (% of GDP)
FDI	Foreign Direct Investment	Foreign Direct Investment net inflows (% of GDP)
DC	Domestic Credit	Domestic Credit to private sector (% of GDP)
INF	Inflation rate	Inflation consumer prices (annual %)
TRAD	Trade ratio	Trade (export +import) (% of GDP)

Source: World Development Indicators, 2016, World Bank

employ the Granger causality test, stationarity and cointegration properties are also required to be tested for the relevant time series variables (Johansen,1988). Therefore, the present study attempts to examine the determinants of FDI through panel unit root test, test for cointegration and Granger causality test. Thrice of these tests are done at panel level.

Unit Root Test: In most of the studies, The Augmented Dickey Fuller (Dickey *et al.*, 1981) unit root test has been employed to detect the order of integration of time series variables at the individual country analysis. But the traditional Augmented Dickey Fuller (ADF) unit root test suffers the problem of low power in rejecting the null hypothesis of stationarity of the time series, particularly for small size of data. To resolve this issue, studies suggests for the use of LLC (Levin *et al.*, 2002) and IPS (Im *et al.*, 2003) panel unit root tests. These two tests have higher power than the unit root test based on individual time series. Both LLC and IPS are very popular and both are based on the lines of ADF principles. The LLC assumes homogeneity in the dynamics of the autoregressive coefficients for all panel numbers, while IPS assumes heterogeneity in these dynamics. LLC proposes a panel-base augmented Dickey-Fuller (ADF) test with a panel setting and restricts ã to keep it identical across cross-sectional regions. The test imposes homogeneity on the autoregressive coefficient that indicates the presence or absence of a unit root whereas the intercept and trend may vary across individual series. The model allows heterogeneity only in the intercept.

Panel cointgegration Tests and Estimation-The cointegration methodology as applied to time series data was first introduced by Engle and Granger (1987), Johansen (1988,1991,1992), Johansen and Juselius (1990,1992) and others in the 1980s. By the early 1990s, cointegration techniques had been extended to apply to panel data. Since 1990, there have been sufficient amount of studies that have exploited this technique since the late 1990s. There has been much research on panel cointegration since the late 1990s. Excellent surveys on nonstationary panels, panel cointegration, and dynamic panels are presented in Baltagi (2008: Ch. 12), Baltagi and Kao (2000), and Banerjee (1999), among others. A panel unit root and cointegration approach has many benefits compared to a conventional time series approach. First, by pooling time series and

cross sections, the finite sample power of a test is significantly improved. Conventional unit root tests, such as the augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests, are widely reported to have low power performance when the time-series sample size is small. Levin, Lin, and Chu (2002) and Im, Pesaran, and Shin (2003), among others, demonstrate that the power of unit root tests using panel data is substantially improved over univariate testing procedures. Mark and Sul (2001), and Pedroni (1999, 2004) also report power improvement with the panel cointegration approach. Second, pooling time series and cross sections (using panel data) may provide more useful information on the nature of the economic system of equations for a group of countries or institutions, than individually analyzing a single equation for each country or institution. Panel unit root tests can be categorized into tests assuming a common unit root process across cross sections and those positing individual unit root processes. Levin, Lin, and Chu (LLC, 2002), Breitung (2000), Hadri (2000), and Harris and Tzavalis (1999) all postulate that there is a common unit root process across cross sections. Im, Pesaran, and Shin (IPS, 2003), Choi (2001), Maddala and Wu (MW, 1999) propose panel unit root tests that allow for individual unit root processes, so that the persistence parameter (autocorrelation coefficient) may vary across cross sections. Among these, only Hadri (2000)'s panel unit root test has the null hypothesis of no unit root, similar to the single series unit root test of Kwiatkowski, Phillips, Schmidt, and Shin (KPSS, 1992). All other panel unit root tests have the null of unit roots. All the researchers above corroborate the fact that panel unit root tests have greater power than conventional single-series unit root tests by Monte Carlo simulations. It is in this light, the panel cointegration tests have been estimated in the present study.

Granger Causality Test- Granger causality test is a technique to estimate the lagged Y influence lagged X significantly and lagged X influence Y significantly. The present study employs this method to analyse the cause and effect relationship among various determinants. The study examines individual time series and panel Granger causality tests for the eight countries.

RESULTS AND DISCUSSION

Table 2 present the results of panel unit root tests for the determinants of FDI in SAARC countries for the period of 2001 to 2015.

The table explains the six distinct unit root tests as Levin, Lin and Chu (LLC 2002), Breitung (2000), Hadri (2000), Im, Pesaran, and Shin (IPS 2003) and ADF chi square statistics on the level variables. Among these, LLC, Breitung and Hadri are based on common unit root test that the autocorrelation coefficients of the tested variables across cross sections are identical. While IPS, ADF-Fisher and PP-Fisher's tests rely on the individual unit root process assumption that the autocorrelation coefficients vary across cross sections. All the five panel unit root tests except for Hadri have the null hypothesis of unit roots, while Hadri's test assumes the null hypothesis of no unit roots (stationarity). The table explains that there is an existence of unit roots in the different

Table 2
Panel unit root tests for the variable (2001-2015)

	Tests assuming a Common Unit Root Process			*Tests assuming a Individual Unit Root Process*		
Series Name	*LLC t*-stat: H_o: Unit root*	*Breitung t-stat: H_o: Unit root*	*Hadri Z-stat: H_o: No Unit root*	*IPS-stat: H_o: Unit root*	*ADF-Fisher Chi ^{2} stat: H_o: Unit root*	*PP-Fisher Chi^2 H_o: Unit root*
RGDP	-3.35 (.0004)	-3.27(.000)	8.32(.000)	-7.781(.499)	18.17(.314)	9.93(.869)
FDI	-7.70(.000)	-4.62(.000)	6.105(.000)	0.805(.490)	12.21(.729)	16.37(.403)
DC	-3.67(.001)	-3.15(.000)	5.82(.000)	0.004(1.000)	.773(1.000)	.7657(1.000)
INF	-9.77(.000)	-8.53(.000)	3.17(.000)	-2.72(.003)	31.60(.011)	35.67(.003)
GCF	8.35(1.000)	1.42(.9223)	2.75(.003)	1.047(.852)	11.72(.762)	12.52(.707)
LF	-1.79(.037)	-0.89(.1885)	7.21(.000)	3.22(.999)	5.10(.995)	13.54(.632)
TRAD	-9.84(.000)	-3.45(.000)	6.58(.000)	-0.718(.236)	17.40(.359)	18.20(.318)

Note: RGDP-real GDP, FDI –Foreign Direct Investment, DC-Domestic credit to private sector (% of GDP), INF-Inflation, consumer prices (annual %),GCF-Gross capital formation (% of GDP), LF-Labor force, total, TRAD-Trade (% of GDP). Numbers in parentheses denote level of significance (p-values).

variables. This lack of stationarity demands the estimation of panel cointegration to examine the long run association ship among/between the various determinants and FDI.

The table 3 explains the diverse panel cointegration tests. The study employs the heterogeneous panel cointegration tests of Pedroni (1999, 2004) which allows the heterogeneous cointegration vectors and dynamic errors, and residual based ADF panel cointegration test of Kao (1999). All the test assume null hypothesis of no cointegration. The table explains the various P-values for the no deterministic trends, deterministic intercept and trend, no deterministic intercept or trend for Pedroni test. Alternative hypothesis and Kao test have also been presented for estimation the cointegration test. The cointegration test was tested with different pairs and combinations. The trend of this test show that the long term relationship exists only between FDI and GDP within the selected determinants. The table explains the significant evidence for a bidirectional cointegration from FDI to GDP and GDP to FDI but this evidence does not confirm the causality between GDP and FDI. It is therefore, causality has to be verified with the help of Granger causality.

Table 4 provides the results of individual and panel Granger causality tests for the SAARC countries. The individual time series explores that it is only Pakistan which shows a strong casual relationship between FDI and GDP and GDP and FDI. Afghanistan, Bhutan, India,Nepal and Sri Lanka have one way causality from GDP to FDI while Maldives does not explain any causality. The panel Granger causality test indicates that there are two way causal relationships between real GDP and FDI and FDI and real GDP in SAARC region. Thus in terms of direction or existence of causality for individual member countries, heterogeneity exist.

Table 3
Panel cointegration test using FDI and GDP for SAARC Countries (2001 -2015)

Panel cointegration tests		*P-Values*	
Pedroni: (H_o: No cointegration)	*No deterministic trend*	*Deterministic intercept and trend*	*No deterministic intercept or trend*
Panel v statistics	0.0775	0.0100	0.0002
Panel rho statistics	0.2687	0.0012	0.0303
Panel PP statistics	0.1409	0.0003	0.0170
Panel ADF statistics	0.1507	0.0000	0.0158
Alternate Hypothesis: individual AR Coefs. (between dimensions)			
Group rho statistics	0.3129	0.794	0.6984
Group PP statistics	0.0013	0.0030	0.0233
Group ADF statistics	00.000	0.0000	0.0079
Kao (H_o: No cointegration)			
ADF t-statistics -3.609620	Prob.-0.0002		

Note: All the values are at 5 % level of significance.

Table 4
Granger Causality Tests
Individual countries and the panel (2001-2015)

	The null hypothesis of Granger causality tests	
Countries	*H_o: FDI does not Granger cause GDP growth*	*H_o: GDP does not Granger cause FDI growth*
Afghanistan	.51 (0.62)	9.78 (0.00)
Bangladesh	1.51(0.42)	4.29 (0.08)
Bhutan	3.51(0.85)	6.28 (0.01)*
India	0.39(0.41)	8.16 (0.00)**
Maldives	0.10(0.48)	0.83 (0.32)**
Nepal	0.11(0.87)*	1.16 (0.001)**
Pakistan	3.91(0.02)**	11.26(0.000)**
Sri Lanka	0.53(0.002)	13.29(0.000)**
Panel Granger causality test (F)	5.51(0.042)**	43.96 (0.000)**

Note: Ho= null hypothesis, figures out of the parentheses are F-statistics, Numbers in parentheses denote level of significance (p-value), * and ** indicate 1 % and 5 % level of significance respectively.

CONCLUSION

The findings of the study suggests that out of the various studied determinants i.e. real GDP (RGDP), the labor force (L), the domestic investment share (INV), domestic credit (DC), inflation (INF), and trade openness (TRAD) , FDI is mainly affected by GDP only. The other determinants except GDP are not evident in having long run association ship with FDI. This express clear and straightforward policy implications that on the basis of individual time series FDI is rarely affecting GDP but it is GDP which is affecting FDI in a significant manner, the economic growth must be targeted to be achieved at individual basis as well as on total basis. All the determinants of growth are needed to be targeted keeping the long term climatic growth in mind.

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