Foreign Direct Investment and Economic Growth in South Asian Region

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Abstract

This study attempts to investigate the determinants of foreign direct investment and the influence of inward foreign direct investment over economic growth in South Asian region. Having identified the gap of analysis of previous literature in this regard, this study was carried out using panel data for the period 1980-2010, adopting panel least square method. Results of the study indicated that there is a significant positive influence of foreign direct investment over economic growth in the South Asian region. The gross domestic product, size of the government, population, gross domestic capital formation and human capital played a momentous role in determining foreign direct investment. To investigate the causality between foreign direct investment and economic growth, Pair-wise Granger Causality tests were employed that suggested the causality is bidirectional at 5% level of significance and uni-directional at 1% level of significance. Further, Pedroni Residual based Cointegration Test confirmed the existence of a long term influence of foreign direct investment over economic growth.

1. Introduction

Through trade and investment, a developing country can achieve a higher economic growth and the extent to which the country could achieve a higher economic growth is stimulated by the process of globalization (Athukorala, 2003). Unlike traditional theories of trade and investment which have suggested international immobility of factors of production, the modern theories consider international mobility of factors of production. In the globalized environment, where countries are not self-sufficient, they have to depend upon trade in goods and services and even in factors of production. It can be seen that it is mostly the developing nations which desire more Foreign Direct Investment (FDI). When a nation suffers from a resource or savings gap, thus causing a foreign exchange gap, an influx of FDI will be helpful in overcoming such crisis situation (Obwona, 2001). The importance of FDI as a source of external finance to developing nations is also highlighted by the international organizations and external advisors (Sahoo, 2006). Most of the developing countries, therefore, have removed restrictions on Foreign Direct Investment (FDI) and offered tax incentives and subsidies in order to encourage foreign investors (Herzer, Klasen and Nowak-Lehman 2006).

With the increasing level of globalization, FDI acts as a catalyst to economic growth (Singh, 2007). FDI may influence the recipient country through

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its impact on capital stock, technology transfer, skill acquisition and market competition (Athukorala, 2003; Obwona, 2001; Nunnenkamp and Spatz, 2003; Sahoo, 2006; Read, 2007; Dhakal et al, 2007), whereas the investing country benefits through efficient utilization of resources (Athukorala, 2003). Apart from that, low cost production facilities, management skills (Graham and Spaulding, n.d.) and augmented domestic savings and investments (Ram and Zhang, 2002) are the benefits that are available to the countries.

Some studies, however postulate that FDI might bring negative repercussions to the host country, particularly in terms of repatriation of funds, transferring inappropriate technologies, creating issues to enterprises, policy implications, creating distortion in the country's social and economic structures (Ram and Zhang, 2002). In the case of Taiwan, for instance, FDI depicted a negative impact on the process of dynamic adjustment, even though the inflow of FDI was expected to exert a positive effect in the short run and long run (Chen et al, 2008).

On the other hand, it is also hypothesized that FDI inflows to a nation is influenced by economic factors. A higher rate of economic growth, for example, is expected to stimulate FDI inflows to a nation (Sun, 2002), while more open social and cultural attitudes, developed management skills and free political system, are believed to be facilitating such inflows.

With this, it is observed that there is a significant degree of ambiguity pertaining to the influence of FDI on economic growth, and also regarding the factors that determine FDI inflows to a particular country or a region. This inconclusiveness prompted the researchers to investigate factors that affect FDI inflows to countries in the South Asian region and also the influence of FDI on economic growth of these countries, in view of suggesting policy recommendations.

This study becomes innovative as it covers the time period from 1980 to 2010 and also all South Asian countries, except Afghanistan due to lack of data. In this study, the researchers have considered both time series aspects and cross section aspects of the data in econometrically studying their dynamics. Non linearity aspects have also been taken into consideration.

Structure of the paper is as follows. In the next section, a review of previous literature is presented. Data and methodology, data presentation and analysis are presented in subsequent sections and the final section is devoted to the conclusion and recommendations.

2. Literature Review

Neoclassical theories advocate that FDI is the engine of economic growth as inward FDI enhances capital formation, generates employment opportunities, stimulates manufacturing of exports, forms spillover effects (Balamurali and Bogahawatte, 2004; Zhang, 2006), enhances market size, affects general wage level, influences the level of education, restructures institutionary environment, tax laws and overall macroeconomic and political environment. They are also the determinants of FDI in the host country (Dhakal et al, 2007). The extent to which a country has the ability to grasp advantages of FDI depends on nation's local conditions, such as absorptive capacity and developments in the local financial

markets (Borensztein, et al 1998; Alfaro et al, 2006). Herms and Lensink (2004) suggest that countries can gain significantly from FDI in terms of their growth rates, only if those countries have well developed financial markets. Developing countries could acquire advanced technologies through FDI investments by multinational firms, where those technologically advanced nations account for a substantial part of research and development allowance (Borensztein et al, 1998). Developing countries could overcome the poverty and underdevelopment through proper use of FDI.

As far as determinants of FDI are concerned, the previous literature has emphasized that infrastructure development, size of the government and international competitiveness are important (Ayanwale, 2007; Udoh and Egwalkhide, 2008), whereas Tsai (1994) suggested that domestic markets, market size, trade balance and nominal wage rate too are of importance. Further it was explained that macroeconomic stability, location advantages (Obwona, 2001), technical progress (Bashir, 1999), openness, abundance of natural resources, human capital (Sawkut et al, 2009) and financial developments (Alfaro et al, 2006) also play a major role. It is noted that some studies too have suggested that there is no independent effect of FDI inflows on economic growth.

When assessing the influence of FDI on economic growth, different outcomes have been obtained by different researchers as mirrored in previous literature. Some have observed a positive (Obwona, 2001) relationship while some others have obtained negative (Agrawal, 2000) or overstated (Tsai, 1994) relationships. As far as the causality is concerned, there exists outcomes with unidirectional [FDI to economic growth (Dhakal et al, 2007), economic growth to FDI (Athukorala, 2003)] or bidirectional (Balamurali and Bogahawatta, 2004) causality. Similarly, a unidirectional relationship in the short run and bidirectional in the long run (Khan and Khan, 2011) and no relationships in short run and long run (Herzer et al, 2006) could also be found in the literature. Thus, empirical evidence on the effect of FDI on economic growth is uncertain, even though FDI, in theory, should motivate economic growth in developing countries (Lyroudi et al, 2004).

3. Data and Methodology

United Nations Geographical region classification includes Afghanistan, Bangladesh, Bhutan, India, Iran, Maldives, Nepal, Pakistan and Sri Lanka for the definition of Southern Asia. However, as per the World Bank classification, South Asian countries include Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. The study is based on the World Bank definition and Afghanistan is excluded from the study due to the non availability of data.

The study was conducted using panel data for the period 1980–2010. Secondary data were collected from the World Bank Data Bank and other trade related documents. The study adopted the Least–Square Dummy Variable (LSDV) model which is alternatively known as Fixed Effects (FE) model, in which, intercept is allowed to vary across countries but not the individual intercept overtime.

As panel data contains more degrees of freedom and sample variability than cross sectional data or time series data, it improves the efficiency of the analysis. Apart from that, it controls omitted variables. However, the significance depends on the compatibility of the assumptions of the statistical tools with the data generating process (Hsiao, 2006).

In order to identify both determinants of FDI and the relationship between FDI and economic growth, the study employed the Cobb-Douglas production function as the base. The following shows the construction of the models based on the Cobb-Douglas production function and the study used the constant values of the variables in view of screening away price effects.

3.1 Determinants Equation
The general form of the production function could be written as,
$$Y = AL^{\alpha}K^{\beta}$$

where,

$\quad$ Y = Out put
$\quad$ A = Technological Progress
$\quad$ L = Labour Input
$\quad$ K = Capital Input
$\quad$ α = Elasticity of Labour
$\quad$ β = Elasticity of Capital

Obtaining the log transformation, the equation can be rewritten as follows:

$$\ln Y = \ln A + \alpha \ln L + \beta \ln K$$

Multi variable population regression function could then be derived econometrically by introducing the stochastic disturbance term and taking first difference of the log–linear function, the new equation is generated as:

$$DLFDI_{it} = \beta_0 + \beta_1 DLGDP_{it} + \beta_2 DLHC_{it} + \beta_3 DLGOV_{it} + \beta_4 DLPOP_{it} + \beta_5 DLNGDFCF_{it}$$

(In the model, i =1…….. 7 stands for individual countries and t = 1980…… 2010 stands for the sample years.)

where,

$DLFDI_{it}$ $\quad$ = First difference of the log of inward FDI

$DLGDP_{it}$ $\quad$ = First difference of the log of gross domestic product

$DLHC_{it}$ $\quad$ = First difference of the log of human capital (Proxied by gross secondary school enrolment)

$DLGOV_{it}$ $\quad$ = First difference of the log of size of the government (Proxied by general government consumption expenditure)

$DLPOP_{it}$ $\quad$ = First difference of the log of population

$DLNGDFCF_{it}$ $\quad$ = First difference of the log of gross domestic fixed capital formation net of Foreign Direct Investment.

3.2 Growth Equation

The study follows four models in determining the influence of FDI on economic growth. For the purpose of the study, researchers have used the model developed by Balamurali and Bogahawatta (2004). However, it is the observation of the researchers that this model has not incorporated an independent variable representing labour, an important determinant in the Cobb-Douglas production function. For the purpose of this study, researches, in the first instance (Model 01) therefore, have decided to introduce labour force also as a determinant. Next, it was also thought of testing the presence of Government, which the researches feel playing an important role in shaping economic growth, particularly in developing countries in South Asia which are subject to analysis in this study. Thus, a second variant (Model 02), incorporating the Government consumption expenditure – generally proportional to the size of the government in the respective countries, – was also tested for its performance in explaining economic growth.

It is also the observation of the researchers that first differences of logarithmic values of variables mirror their growth scales. Therefore, it was felt appropriate to test out models in which year-to-year percentage growth rates of variables used in the first two models are regressed (Models 03 and 04), in the belief that such would enrich the research by (a) making available a wider choice in selecting the best fitting model, and (b) enhancing the reliability of outcomes upon emergence of consistent results.

The four models thus tested are presented below.

$$DLGDP_{it} = \beta_0 + \beta_1 DLFDI_{it} + \beta_2 DLNGDFCF_{it} + \beta_3 DLLF_{it} + \beta_4 DLOPEN_{it} \text{-- (1)}$$
$$DLGDP_{it} = \beta_0 + \beta_1 DLFDI_{it} + \beta_2 DLNGDFCF_{it} + \beta_3 DLLF_{it} + \beta_4 DLOPEN_{it} + \beta_5 GOV_{it} \text{-- (2)}$$

$$GDPGR_{it} = \beta_0 + \beta_1 LFGR_{it} + \beta_2 NGDFCFGR_{it} + \beta_3 DLFDIGR_{it} + \beta_4 DLOPENGR_{it} \text{-- (3)}$$
$$GDPGR_{it} = \beta_0 + \beta_1 LFGR_{it} + \beta_2 NGDFCFGR_{it} + \beta_3 DLFDIGR_{it} + \beta_4 DLOPENGR_{it} + \beta_5 GOVGR_{it} \text{--(4)}$$

where,

$DLGDP_{it}$	= First difference of the log of GDP
$DLLF_{it}$	= First difference of the log of labour force
$DLOPEN_{it}$	= First difference of the log of openness to trade
$DLFDI_{it}$	= First difference of the log of inward FDI
$DLNGDFCF_{it}$	=First difference of the log of gross domestic fixed capital formation net of FDI
$DLGOV_{it}$	= First difference of the log of size of the government (Proxied by general government consumption expenditure)
$GDPGR_{it}$	= Growth rate of GDP
$LFGR_{it}$	= Growth rate of labour force
$NGDFCFGR_{it}$	= Growth rate of gross domestic fixed capital formation net of FDI
$FDIGR_{it}$	= Growth rate of FDI
$OPENGR_{it}$	= Growth rate of Openness

$GOVGR_{it}$ = Growth rate of size of the government (Proxied by general government consumption expenditure)

For the purpose of the study, the null hypothesis of no significant impact of the independent variable on the dependent variable was tested against the alternative hypothesis of prevalence of a significant impact of the independent variable on the dependent variable.

4. Data Presentation and Analysis

Analysis of the distribution of world FDI illustrates the following. Graphs also depict the rising importance of the Asian region.
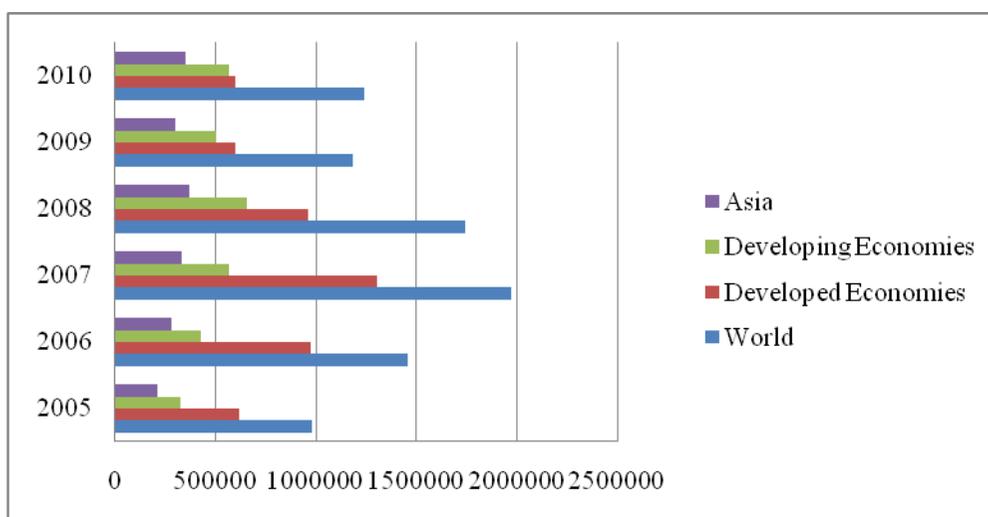

Figure 1: **Distribution of FDI inflows into different economies (in US Dollars million)**
Source: Author constructed based on World Investment Report, 2011 - UNCTAD

The above graph shows the distribution of world FDI inflows among developed nations and developing nations. In order to show the importance of Asia, FDI flown into Asia have also been represented. The graph depicts that FDI flown into developed economies has increased till 2007 and thereafter decreased. At the same time FDI flown into developing nations and Asia also shows a declining trend after 2007. In 2010, developing countries have received close to half of the total FDI inflows. Asia was able to grab more than half of the total FDI inflows.

Figure 02 depicts the distribution of FDI inflows into Asia among South-East Asia, South Asia* (Includes countries categorized as South Asia by the UNCTAD), South Asia** (Includes all countries except Afghanistan as per the World Bank definition of South Asian countries) and West Asia. Figure 02 further

explains that the majority of the FDI inflows are flown into South-East Asia and West Asia. However, the importance of the West Asia has declined over time and its place is taken over by the South-East Asia. The importance of South Asia has a declining trend after 2008. This fact represents the appropriateness of investigating the behaviour of FDI and economic growth, in an attempt to reap the full benefit.
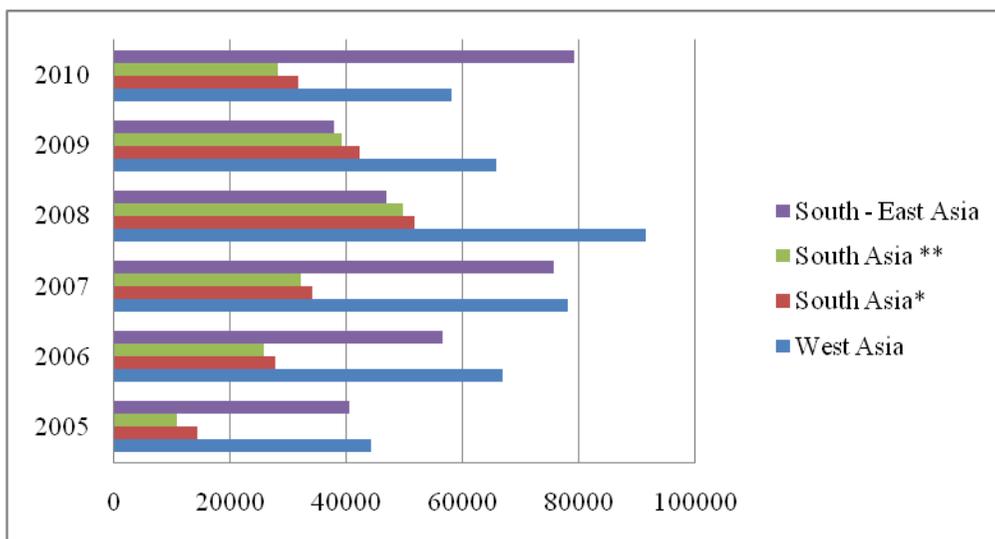

Figure 2: **Distribution of FDI inflows into Asia (in US Dollars million)**
Source: Author constructed based on World Investment Report, 2011 – UNCTAD

For the study, researchers adopted fixed effects as suggested by the Hausman Test. Prior to the estimation process of the determinants equation and growth equation, all the variables concerned have been tested for stationary process using panel least squares unit root test (Levin, Lin and Chu test) for the period concerned. Table 01 shows the results of the Levin, Lin and Chu test of panel unit root test. All the variables that have been employed in calculating determinant equation and model 01 and model 02 are I(1) variables, whereas, in calculating model 03 and model 04, the researchers have used I(0) variables. First difference of all variables has been defined and denoted by the letter D in front of the log function.

The determinant equation is then estimated to yield the following results (Table 02). Results of the determinants equation confirm that the GDP has a significant impact on the determination of FDI. The positive sign indicates that higher GDP induces FDI and it supports the excellent performance of the country. Foreign investors get attracted to the countries when the country maintains good records of economic performance. Besides, when the country's performance improves, foreign investors are confident about the country and lead them to invest in the country. Thus, this positive relationship has been stressed in the empirical literature as well [Bashir (1999) and Alfaro et al (2006)]. Human capital exerts a significant positive influence in the determination of FDI. It is because in the South

Asian region, educated workforce is available at a cheaper rate of return that induces foreign investors to invest. Further, human capital could affect factor productivity growth through its impact on the capacity of a nation to adapt and use foreign technology. In the determination of FDI, size of the government sector affects positively and significantly. Anyanwu (2011) has also found that there is a significant positive relationship. It is because, as the government expenditure increases, investors will be confident and that leads to increase the level of FDI. As far as population is concerned, there exists a significant positive relationship. It is because of the market size. On the one hand, population provides inputs required for the efficient production, and on the other hand it creates a demand for the products. Wilhelms and Witter (1998) have also reached similar conclusions. Gross domestic fixed capital formation net of FDI exerts a significant positive relationship on FDI showing the importance of domestic investments.

Even though the R-squared is 0.3851, the explanatory power is not given the same interpretation in the panel data. There exist no multicollinearity (conducted through correlation matrix), Heteroskedasticity (Through white test that suggested probability value of obs*R^2 is less than the chi-square test statistics) and autocorrelation in the model (Durbin-Watson Statistic).

5. Determination of the Influence of FDI on Economic Growth and Causality between FDI and Economic Growth

In order to identify the influence of FDI on economic growth, all four models have been tested and retained for further analysis. In addition to these four models, the researchers also tested the base model [that of Balamurali and Bogahawatte (2004)], and also another model comprising of growth rates of the same variables; but both these variants suffered from a number of weaknesses, and thus could not qualify to be included in the analysis.[2]

The independent variable representing FDI emerged significant in all models retained as satisfactorily and (at one per cent level in the models 02, 03, and 04 and at five per cent level in the model 01) and bearing a positive influence over the respective dependent growth variables tested in each model. Therefore, it could be safely concluded that FDI exerts a significant positive influence on economic growth in the South Asian countries.

This result conforms to the theoretical reasoning that FDI inflows into developing economies are growth supporting, and also to the findings of Alfaro et al (2006) and Ram and Zhang (2002). With FDI flowing into a country, its people would secure access to modern and advanced technology and know–how which would get transferred over to the national economy by way of locals having acquired know-how in such FDI-based industries moving over to domestic firms. Apart from that, locals could increase their management skills and organization skills that in turn could positively influence the GDP of a nation. As foreign

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[2] They suffered from (a) lower explanatory power (lower value for sum of squared residuals), (b) prevalence of autocorrelation (represented by D-W Statistic), and (c) the value of the constant being significant (possibly indicating omission of variables), that led to the exclusion of these variants from further analysis.

investors would demand domestic resources, it would cause local market stimulation and greater income levels accrue to domestic resource owners. More significantly, the FDI based enterprises generally have a better exposure to the world markets thereby generating a favourable impetus on promoting exports from FDI-recipient economies.

Gross domestic fixed capital formation (net of FDI) caused a significant positive effect on economic growth in all four models. This is also emphasized in Narayan and Sanhita (n.d.). The reason is that the higher capital formation promotes economic growth by increasing productive capacity.

It is interesting to observe that introduction of labour variable proved beneficial as all models tested improved in their explanatory power with that variable than without it. Therefore, the researchers are of the opinion that the present exercise is an improvement upon Balamurali and Bogahawatta (2004). Labour force exerts a significant positive relationship on economic growth as well. Increase in labour force leads to more provision of labour and more local industries where the value addition is very high for the country concerned.

Introduction of the Government variable was another experiment done in this study. Such an introduction also falls in line with the studies conducted by Ayanwale (2007) and Udoh and Egwaikhide (2008), who have indicated that the size of the government would be regarded as a determinant of growth. This appears to have been reconfirmed in the present exercise where all variants of models estimated improved in their explanatory power (as indicated by the lowered sum of squares of residuals) whenever the 'Size of the Government' proxy was introduced as a determinant. There could be a number of economic explanations to this effect, including (a) the possibility of economic stability through better national security and regular mechanisms through Governmental intervention, (b) public investment facilitation in Government's economic activities including public enterprise management and infrastructure development, (c) better reaching needy segments with necessary assistance (welfare and social security) preventing degradation of their purchasing power and thus managing effective demand among low income masses in these counties-, and also (d) development of more human and social capital which would promote and strengthen economic growth.

In the presence and absence of the government consumption variable, models 01 and 02 showed contradictory results (a positive and negative respectively) with respect to the influence of openness over economic growth. However comparing model 03 and model 04, the inclusion or exclusion of the government consumption variable has not changed the sign of the openness variable, thus representing a positive influence over the growth. According to these results, the influence of openness over GDP cannot be directly confirmed, and needs further investigation through research in order to confirm the behaviour. However, comparing sum of squared residuals for all models represented that the best explained is model 02. Therefore, the study concludes that there exists a significant positive influence of openness on economic growth (according to model 02). This also represents the growing importance of the process of globalization.

R -squared value of the models represents the explanatory power of the model. In the case of panel data, the value has no meaningful insight. There exist no

multicollinearity (conducted through correlation matrix), Heteroskedasticity (Through white test that suggested probability value of obs*R^2 is less than the chi-square test statistics) and autocorrelation in the model (Durbin- Watson Statistic).

As far as four models are concerned, sum of squared residual is the lowest in model 02 and could be concluded that model 02 is the best explained model in analyzing the relationship between FDI and economic growth.

6. Causality among Variables

Analysis of the causality between variables indicates that the null hypothesis of DLFDI does not granger causes DLGDP is rejected at the 5% of significant level. Thus, FDI is a function of GDP at five per cent of significance level. When analyzing the reverse causality, probability at 1% with two lags indicates the null hypothesis of DLGDP does not granger causes DLFDI is rejected and DLGDP is included as a determinant of DLFDI. Causality, therefore is bidirectional at 5% level of significance (with 4 lags) and uni-directional at 1% level of significance (with 2 lags) (refer to Table 4).

7. Tests for Cointegration

In order to test for long run relationship, researchers have employed the cointegration test. Pedroni Panel Cointegration test results are given in Table 5. The test has been carried out with the null hypothesis of no cointegration. The result indicated that the null hypothesis could be rejected at 1% level of significance for all test statistics. Thus, the researchers concluded that there is cointegration between FDI and GDP.
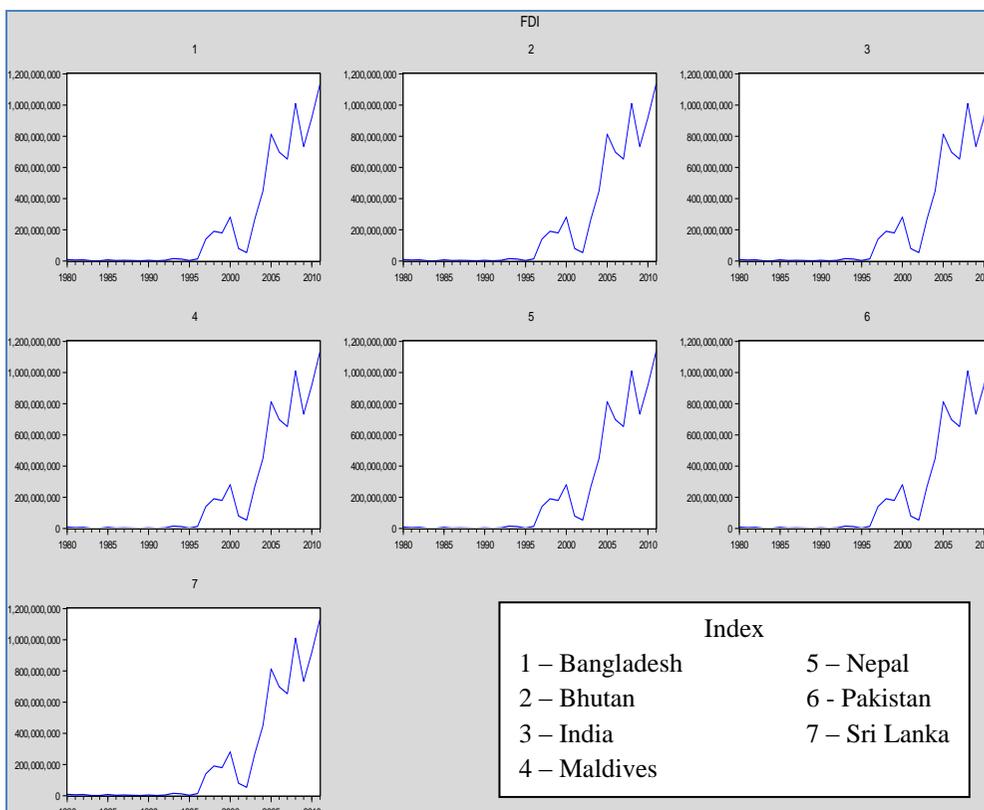
Figure 3: **Inward FDI trend in the South Asian countries**
Source: Author constructed

8. Conclusion and Recommendations

Most of the developing countries have significantly eliminated restrictions on foreign direct investment and have taken measures to attract foreign capital (Herzer, 2010). Through FDI, a nation can acquire foreign technology and know–how and with direct capital financing, FDI helps economic growth and thus towards economic development (Alfaro et al, 2006) and foreign investor confidence (Sun, 2002). However, potential negative effects to the host country have also been considered (Ram and Zhang, 2002). The higher rate of economic growth might induce FDI for a nation through improvements in social and cultural attitudes, enhanced management skills and free political system.

According to the determinants of FDI, the study concluded that economic growth, human capital, size of the government, population and gross domestic fixed capital formation (net of FDI) exert positive and significant relationships. In the determination of the growth rate, researchers have found out that, FDI, gross domestic fixed capital formation, government expenditure and labour force are of importance and all variables have shown positive impacts on the determination of growth, whereas the relationship between openness and GDP is not clear in the results and require more investigation. As far as causality is concerned, FDI causes

GDP at 5% level of significance with 4 lags and GDP causes FDI at 1% level of significance with 2 lags. Cointegration shows that there exists a long run relationship. The study could finally conclude the prevalence of short run and long run relationship between FDI and economic growth.

As FDI exerts a positive effect on economic growth, any increase in FDI leads to an increase in the economic growth of the countries in the South Asian region. Thus, in South Asian region, FDI has played a central role in the short run. That is clearly visible in all four models. FDI has become a vital factor in stimulating the growth potential of South Asia. Thus, the government should promote FDI into the country and at the same time, the countries should ensure that FDI is flown into productive activities in order to reap the full benefits out of it. Increase in GDP would increase investors' confidence about the country and on the return of the investments as well. A higher economic growth would imply both developed infrastructure and financial markets. This would also increase the attractiveness of the country for foreigners. As FDI has a positive impact, the nations should also capture the developed technology, know-how and managerial skills and channel them into the domestic production thereby increasing the productivity potential of the domestic firms. Apart from that, government should promote export oriented strategy that will help to develop the production in the domestic nation.

Thus, national policies should be adopted to strengthen the relationship between FDI and domestic investments and such relationship has to be complementary rather than competitive. Apart from that, FDI externalities might have trivial effects if the links with local business were weak. Thus, it is suggested to increase the domestic savings thereby strengthening the linkages between foreign investors and domestic producers.

When educated labour force is available at a cheaper/concessionary rate, foreign investors are motivated to invest in that country. Thus, this leads to an increase in inward FDI flows. Apart from that, when people are more educated, they will make their investments in the domestic nation that makes the overall value addition to the nation high. This would increase GDP of the country and the governments should take necessary steps to use the productive workers in an attempt to have a positive economic growth. When the domestic market size is continuously expanding, it directs the foreign investors to spread out their activities and it gives them a larger consumer base as well. Increase in the productive labour force would increase the production capacity and GDP of the country as well. Increase in capital formation represents a higher level of social capital and that would get added to production and growth. Increase in social capital would motivate the foreign investors. Further, the more open the trade of a nation is, the more its economic growth will be. This will on the one hand help the consumers and producers, while on the other, would increase the size of the globalization.

As there is a bi-directional causality, it has imperative policy implications. If GDP growth attracts more FDI inflows, then promotional policies to encourage inward flows of FDI alone may become futile. Instead, efforts should be directed to other probable sources of growth. Once growth is enhanced and stimulated, foreign capital will be attracted.

This study would be a guide to future research. The research could be extended by analyzing sector wise FDI inflows and domestic value added to each sector. Apart from that, one could carry out a comparative analysis with regard to different sectors. Moreover, separate country-wise analysis could be performed to analyze the relationship between FDI and economic growth in the presence of military/defense expenditure. This type of analysis would be of utmost importance for countries that suffer from civil wars/ unrests. Another important study would be to find out the relationship between exports and FDI. Finally, the same study can be done using primary data and check for differences between the results obtained from secondary data and from primary data. The study could also be extended by the results of the causality and cointegration to provide more sizable results and cross region comparison could be generated.

Since in this study researchers have considered and analyzed data for open economies, it is apparent that the coefficient of openness variable tends to be positive. Thus, results of this study are region specific and further exertion is to be done in order to generalize the scenario into global context. However, this study would be a starting point for such an analysis.

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Table 1: **Results of the panel unit root test – Levin, Lin and Chu test**

Variable	Probability	
	Level	**First Difference**
LFDIN	0.0126*	0.0000**
LGDP	0.6972	0.0036**
LGOV	0.7238	0.0000**
LHC	0.4580	0.0000**
LPOP	0.0236*	0.0004**
LNGFCF	0.0058**	0.0001**
LLF	0.2318	0.0416*
LOPEN	0.6743	0.0000**
LCPI	0.0054**	0.0285*
L(FDI*HC)	0.3421	0.0005**
GDPGR	0.0000**	0.0000**
LFGR	0.0008**	0.0000**
NGFCFGR	0.0079**	0.0000**
FDINGR	0.0000**	0.0000**
OPENGR	0.0367*	0.0076**
GOVGR	0.0000**	0.0000**

**significant at 1%   * significant at 5%
Source: Author constructed

Table 2: **Results of the determinants equation**

Estimation output of the determinants equation		
$DLFDIN_{it} = \beta_0 + \beta_1 DLGDP_{it} + \beta_2 DLHC_{it} + \beta_3 DLGOV_{it} + \beta_4 DLPOP_{it} + \beta_5 DLNGDFCF_{it}$		
Variable	**Coefficient**	**Probability**
Constant	-9.5773	0.3875
DLGDP	0.6850	0.0000**
DLHC	0.2573	0.0005**
DLGOV	1.3753	0.0126*
DLPOP	0.4392	0.0000**
DLNGDFCF	0.7562	0.0000**
R- Squared = 0.3851		
Durbin Watson Statistic = 2.0057		

**significant at 1%   *significant at 5%
Source: Author constructed

Table 3: **Results of growth equations**

Variable	Model 01 Coefficient	Model 01 Probability	Model 02 Coefficient	Model 02 Probability	Model 03 Coefficient	Model 03 Probability	Model 04 Coefficient	Model 04 Probability
Constant	0.0012	0.8472	0.3211	0.5462	0.7752	0.0632	0.5643	0.5375
DLFDI	0.0413	0.0225*	0.1673	0.0000**	-	-	-	-
DLCDFCF	0.8584	0.0000**	0.6972	0.0001**	-	-	-	-
DLLF	0.1607	0.0000**	0.4307	0.0045**	-	-	-	-
DLOPEN	-0.4636	0.0000**	0.0201	0.0432*	-	-	-	-
DLGOV	-	-	0.3534	0.0000**	-	-	-	-
LFGR	-	-	-	-	0.3275	0.0000**	0.0243	0.0057**
GDFCFGR	-	-	-	-	0.0052	0.0011**	0.0502	0.0000**
FDIGR	-	-	-	-	0.0175	0.0000**	0.0072	0.0000**
OPENGR	-	-	-	-	0.523	0.0537	0.2365	0.0153**
GOVGR	-	-	-	-	-	-	0.723	0.0325*
R squared	0.5846		0.5213		0.4813		0.514	
Sum of squared residuals	2.0335		2.0241		2.4123		2.232	
D-W statistic	2.0651		2.0032		2.0123		2.071	

**significant at 1%   *significant at 5%

Source: Author constructed

Table 4: **Results of the pair-wise Granger Causality test**

Results of the Pair-wise Granger Causality test			
Null Hypothesis	**Probability**		
	Lags = 2	**Lags = 3**	**Lags = 4**
DLFDIN does not granger cause DLGDP	0.5605	0.8931	0.0342*
DLGDP does not granger cause DLFDIN	0.0065**	0.0021**	0.0000**

**significant at 1%   *significant at 5%
Source: Author constructed

Table 5: **Results of the PedroniCointegration test**

Results of the Pedroni Panel Cointegration test		
	Statistic	**Probability**
Panel v – Statistic	-0.5674	0.0000**
Panel rho – Statistic	-2.5436	0.0000**
Panel pp – Statistic	-6.8754	0.0045**
Panel ADF – Statistic	-5.8765	0.0002**
Group rho – Statistic	-3.2341	0.0000**
Group pp – Statistic	-6.9834	0.0003**
Group ADF – Statistic	-2.6432	0.0000**

**significant at 1%
Source: Author constructed