Panel Cointegration and Granger Causality Approach to Foreign Direct Investment and Economic Growth in South Asian Countries

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Abstract: The aim of this study is to examine the long run equilibrium relationship between FDI, growth rate and economic growth in the developing countries of South Asia. Data was collected from the United Nations Conference on Trade and Development and World Bank Development Indicator from 1990 to 2017. However, Johansen Fisher Panel Cointegration and Pairwise Dumitrescu Hurlin Panel Causality Tests were utilized to address the objective of this paper. Consequently, it was discovered that a long run equilibrium relationship exists between FDI, growth rate of economy and economic growth in the developing countries of South Asia within the period under consideration. Moreover, there is an existence of unidirectional causality running from both growth rate and economic growth to FDI inflows in these countries. This implies that whenever the target of the policy makers in these economies is to facilitate the sporadic inflows of foreign capital, expanding the market size and manipulating the rate of economic growth would induce an increase in FDI inflows in the long run. Finally, the important findings that emerged in this work made this paper to recommend the following vital policy for the policy makers, investors, financial institutions regulators and future researchers. Therefore, the policy makers in the developing countries of South Asia should come up with the strategic policy measure that will expand the market size and ensure a sustainable growth rate in this sub region.

Keywords: FDI; Market Size; Growth Rate; Cointegration; Granger Causality and South Asia

JEL Classification: F21; F23; F36

1. Introduction

The sporadic inflows of foreign direct investment in the developing countries of Asian continent has been a subject of interest among scholars in the last decade. The stock of FDI inflows has risen by 25% from 2008 to 2017 in this region of the world.

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(UNCTAD, 2018). It is worth of note that the developing economies of the South and Southeast Asia have been declared as the highest recipients of global FDI inflows among comity of developing countries. (UCTAD, 2016, UNCTAD, 2018).

However, in the South Asia sub region, the inflows of FDI have been observed to be consistent in the last decade. The global investment report of UNCTAD shows that some countries like India, Bangladesh, Iran, Pakistan and Sri Lanka in this region have registered exceptional performance in attracting cross border investment. The statistics from this report indicates that from 2010 to 2017, these countries have improved their FDI inflows by 45.5%, 135.6%, 37.5%, 38.8%, and 187.8% respectively.

Consequently, it is undeniable fact that investment is one of the principal variables that derives economic growth. Robert Solow underscored this argument by enunciating that capital is a necessary condition for economic growth. It has been established in the literature that FDI inflows has the propensity to propel the productive capacity of the host economy through the technology transfer, market competition, acquisition of skills, employment generation and inducing living standard. Meanwhile, the rate of economic growth in South Asia has been impressive in the recent time. The average growth rate of majority of the countries in this region has been observed to surpass the developed economies in the last decade.

However, despite the fact that the developing countries of Asia have been a focal point of research in the last couple of years, but South Asian sub region is yet to get enough research attention about FDI among scholars relative to other developing regions in the globe. (Bimal, 2017). In the same vein, it has been observed that the bulk of recent FDI research in this region focuses on the determinants of this cross border investment. See Tiwari and Mutasque (2011), Azam (2010), Sahoo (2006), Minhas and Ahsan (2015), and Mottaleb and Kalirajan (2010). Having identified this gap in the literature, there is a compelling need to examine and validate the nature of relationship that exists between FDI and economic growth in South Asia. In order to contribute to the exiting literature, this study would move the frontiers of knowledge by examining the nexus between FDI inflows and economic growth in 5 major countries of South Asia, namely India, Bangladesh, Iran, Pakistan and Sri Lanka.

2. Empirical Literature Review

The literature on FDI in developing countries, emerging countries and developed countries are presented in this section of the paper as follows.

Wei (2005) critically investigated the variables that propel FDI inflows in China and India. The author concluded that the factors that derive FDI inflows in India are lower country risk, cheaper cost of labor, geographic closeness to OECD countries,

and cultural similarity. The study also established that what caused the wide gap between FDI inflows in China and India was the China had the capacity to attract much higher FDI from OECD countries because the country has larger market size and higher external trade relation with OECD countries. In another perspective, Carcovic and Levin (2000) utilized Ordinary Least Square model in estimating the relationship between FDI and economic growth in 72 developing economies from 1960 and 1995. The results from the study concluded that FDI and economic growth did not have a significant relationship in the countries under study. While examining a comparative analysis of FDI inflows performances in BRICS countries and other two emerging countries in Asian continent from 1990 to 2017, Aderemi et al (2018:1) applied Ordinary Least Square model to validate that the key determining variables of FDI inflows in Chinese economy are growth rate, GDP per capita growth and large market size. Meanwhile, in countries like Brazil, India, South Africa, Singapore and Hong Kong, market size has been identified as the major factor that derived inflows of FDI in these economies. Also, GDP per capita growth in both Russia and South Africa has been concluded to be an insignificant factor that caused inflows of FDI inflows

However, Agrawal et al. (2011) used modified growth model and Ordinary Least Square model to analysis how FDI and economic growth are related in China and India from 1993 to 2009. The authors established that the larger market size of the Chinese economy is the major reason why the foreign investors have more interest in china than India. In another study, Frenkel et al (2004) adopted gravity model and panel data analysis to estimate FDI inflow between major developed countries and twenty-two emerging nations. It was concluded from the paper that the principal variable that derives how FDI flows within these countries are the distance and characteristics of both home and host economies. While examining factors that propel FDI inflows in Indonesia, India and Pakistan from 1971 to 2005, Azam (2010) used OLS and Log Linear Regression Models to establish that external debt, market size, domestic investment, trade openness and physical infrastructure are the principal determinants of FDI inflows in these countries. It was noticed from the reported results that Pakistan and India are similar, when trade openness and government consumption are put in isolation but the results from Indonesia was not correlated with the reported variables that propel FDI India and Pakistan.

Consequently, Falki, (2009) examined the relationship between FDI and economic growth in Pakistan between 1980 and 2006 with the aid of Ordinary Least Square. The result that emanated from the paper submitted that there is an insignificant inverse relationship between FDI and GDP of the country. In another perspective, Aderemi et al (2018:2) critically analyzed the determining factors of FDI inflows in China and the US from 2002 and 2017 with the aid of OLS modeling. It was discovered from the study that FDI inflows is principally driven by the market size of the US economy but GDP per capita growth was the major variable that derived

China FDI inflows on the other hand. Atique et al, (2004) applied Eangle Granger and Hansen models to posit that the contribution of FDI inflows to the economy is more than exports. Similarly, Zhang (2001) analyzed FDI inflows and economic growth in 11 high-income and low-income developing economies in East Asia and Latin America with the adoption of Johansen cointegration test, the error-correlation model and the Granger causality test. The author submitted that the effect of FDI in the host economies is country-specific. The paper also confirmed that the inflows of FDI have propensity to propel the growth of East Asian economies if these economies are opened via external trade, development of human capital and education improvement. When using panel data analysis, Hudea and Stancu (2012) estimated the link that exists between technology transfer, foreign direct investments and economic growth in seven East European countries from 1993 to 2009. The researchers established that in both short run and long run FDI and economic growth have a positive relationship in those European nations.

Moreover, Kim and Seo (2003) examined the linked between FDI and economic growth and domestic investment in Korea economy from 1959 to 1999 with the application of vector auto regression model. It was discovered from the study that the relationship between FDI and economic growth is positive and significant. It was also concluded that domestic investment did not crowd out by the inflows of FDI as well. Mallick and Moore (2008) analyzed a panel data of 60 developing countries between the periods of 1970 and 2003. It was discovered from the study that the inflows of FDI has a significant positive impact on economic growth in all high income groups. However, the opposite was the result of lower income group. In the same vein, Chang (2007) concluded that there was no causal relationship between inflows of FDI and economic growth in Taiwan when estimating the Johansen cointegration test, the multivariate error correction model, and the Granger causality to assert that no causal relationship existed between FDI inflows and economic growth in Taiwan. Tiwari and Mutasque (2011) investigated how FDI and economic growth are related in Asian countries from 1986 to 2008 with the panel data analysis. The author submitted that the principal variables that propel economic growth in these countries are FDI, Labor, capital and exports.

However, the reviewed of the empirical literature so far established that the researches on FDI inflows and economic growth are ongoing especially in the emerging countries of Asia, and the literature is yet to reach a consensus about the nature of the relationship that exists between these variables. Hence, the relevance of this study.

2.1. An Overview of South Asian Countries

Table I. Annual GDP Growth Rate between 1990 and 2017

Year/Country	Bangladesh	India	Sri Lanka	Pakistan	Iran
2007	4.8	9.8	6.8	4.8	8.2
2008	1.7	3.7	6	1.7	0.3
2009	2.8	8.5	3.5	2.8	1
2010	1.6	10.3	8	1.6	5.8
2011	2.7	6.6	8.4	2.7	2.6
2012	3.5	5.5	9.1	3.5	-7.4
2013	4.4	6.4	3.4	4.4	-0.2
2014	4.7	7.4	5	4.7	4.6
2015	4.7	8.2	5	4.7	-1.3
2016	5.5	7.1	4.5	5.5	13.4
2017	5.7	6.6	3.1	5.7	4.3
Average	3.8	7.3	5.7	3.8	2.1

Source: WDI, 2018

In the last decade, the average growth rates in India and Sri Lanka have been observed to be higher than those of the developed economies. Indian economy has the highest growth rate among the selected countries, followed by Sri Lanka. The economic growth rate in Bangladesh and Pakistan have a similar indicator. Meanwhile, the Iran came last among the selected countries.

Table II. Percent of FDI inflows Increment in the Last Decade

Year/Country	Bangladesh	India	Sri Lanka	Pakistan	Iran
2007-2017	135.6%	45.5%	187.8%	38.8%	37.5%

Source: UNCTADstat, 2018

The rate at which the inflows of cross border investment has risen in the respective countries under investigation has been presented in the table above. It could be pinpointed that Sri Lanka`s FDI inflows have risen by the highest percentage in the last decade, followed by Bangladesh, India and Pakistan respectively. Iran registered the least percentage increment among the selected countries.

It is worth of note that, Sri Lanka was the first economy in the South Asian sub region to liberalize its national economy to the global community in 1977. This liberalization made the country to adopt a series of policy measures such as the rationalization of public expenditure, export promotion, liberalization of trade policy and exchange rate system, and incentives to investment. It has been observed that from the advent economic liberalization till now, Sri Lanka has remained one of the most outward oriented economies in the sub region. This has been one of the critical factors that has contributed to FDI inflows in the country. Similarly, in the early 80s,

India commenced reforming the structure of its economy. In 1991, aggressive privatization and liberalization policies began in the country due to the balance of payment and foreign exchange liquidity problem disrupted the economy in that year. Subsequently, a number of policies has been introduced in the country to ensure the integration of the economy with the rest of the world. In the same vein, in 2002, India embarked on the second phase of economy reforms tagged second generation reforms with a view to reducing the fiscal deficit, reforming labor laws and invigorating the states involvement in the active economy management and improving infrastructural facilities.

Moreover, the country of Bangladesh was not left behind when it comes to economic reformation. The country embarked on the landmark economic reforms in the 1980s and early 90s. The initial reform took place in Bangladesh through the advent of the structural adjustment programme which was sponsored by the World Bank and the IMF. The World Bank structural and sectoral adjustment loans (SALs and SECLs) was introduced in the country. Later, a three-year IMF sponsored structural adjustment facility (SAF) was equally implemented in 1986. However, this policy measure sparked off the advent of various policy initiatives in 1990s, such as agricultural policy, privatization and public enterprise reforms, trade and industrial policy fiscal policy reform and financial sector reform.

Furthermore, Pakistan took its first step to liberalize its investment policies in 1984. The country made an industrial policy statement that ensures an equal opportunity to the public and private sectors in the country. Therefore, the introduction of foreign private investment, joint equity participation of foreign and local investors in the areas of managerial and technical skills, marketing expertise and advanced technology was incorporated in the country to boost participation of foreign investors in the country. In order to facilitate sporadic inflows of cross border investment in this country, a new industrial policy package came on board in 1989 with a mandate to recognize crucial impact of the private sector in propelling investment in the country. As a result of this, a series of regulatory measures were put in place to generally improve the business environment so that FDI could be attracted in the country. Within the period, the Board of Investment (BOI) was set up in conjunction with the PM's secretariat, with a mandate to create platforms that will serve as attraction to foreign investors in the economy. Within the period Pakistan had signed bilateral agreements on the promotion and protection of investment with 46 countries which later caused sporadic inflows of FDI in the country.

Moreover, in 2000s, Iran liberalized its investment regulation. As a result of this, FDI inflows in this economy has been moving in towards few strategic industries of the economy such as vehicle manufacturing industries, oil and gas industries, petrochemical and pharmaceutical industries and copper and mining industries.

Between 1992 and 2009, approximated 485 projects with values of US$34.6 billion of cross border investment has been received by the Iranian economy.

In conclusion, in the past few decades, the developing countries of South Asia have been liberalizing their economies on a continuous basis with aggressive policy changes in their macroeconomic variables, competitive FDI and trade policies so that a friendly investment climate that would catalyze the emergency of foreign investors in the country could be created.

3. Methodology

This paper makes use of secondary data from 1990 to 2017. Data on FDI were got from UNCTAD investment report of the World Bank. Meanwhile, data on other macroeconomic variables such as GDP and growth rate of the economy were extracted from World Bank Development Indicator.

3.1. Estimation Techniques

This study employs the Augmented Dickey Fuller (ADF) and Philips-Perron (PP) unit root tests, Johansen co-integration test and panel granger causality. All these estimation techniques were used to examine the nature of relationship that exists between FDI and economic growth in the selected countries. Consequently, the stationary of a variables is a crucial factor to consider in analysis of the variables because it can influence their performance in such a way that a spurious result can emanate from the study. However, if the time series variables possess unit roots, this means that the variables might drift away in the short run and converge in the long run if they are cointegrated. This is the idea behind the cointegration technique put forward by Johansen and Juselius (1990). Moreover, attempt to examine the feedback effect among the variables of interest led to the estimation of the causal relationship between the variables with the adoption of a recently-developed panel causality test, known as Dumitrescu and Hurlin (2012) causality test. The linear panel causality model can demonstrated as follows:

$$GDP_{it} = \alpha_0 + \sum_{i=0}^{p} \alpha_1 FDI_{it-1} + \sum_{i=0}^{p} \alpha_2 GRT_{it-1} + \sum_{i=0}^{p} \alpha_3 GDP_{it-1} + U_{1it} \text{ - - - - - - - (I)}$$

$$GRT_{it} = \gamma_0 + \sum_{i=0}^{p} \gamma_1 FDI_{it-1} + \sum_{i=0}^{p} \gamma_2 GRT_{it-1} + \sum_{i=0}^{p} \gamma_3 GDP_{it-1} + U_{2it} \text{ - - - - - - - - (II)}$$

$$FDI_{it} = \beta_0 + \sum_{i=0}^{p} \beta_1 FDI_{it-1} + \sum_{i=0}^{p} \beta_2 GRT_{it-1} + \sum_{i=0}^{p} \beta_3 GDP_{it-1} + U_{3it} \text{ - - - -- - - - (III)}$$

Where

GDP is used to proxy economic growth.

GRT denotes growth rate of economy.

FDI is used to represent the inflows of foreign direct investment in the selected countries.

U_{1it}, U_{2it} and U_{3it} connote error terms, p is the lag length and t = 1990……..2107. While i =1….5.

The countries selected for this study are Sri Lanka, India, Bangladesh, Islamic Republic of Iran and Pakistan. The availability of the relevant data for this study motivated the choice of these countries among other countries in the South Asia sub region.

3.2. Result and Discussion

Table III. Panel Unit Root Test

Variables	Panel ADF Test			Panel PP Test		
	Level	First Difference	Remarks	Level	First Difference	Remarks
RGDP	0.00499 (1.0000)	3.04145 (0.9804)	I (2)	9.2E-05 (1.0000)	4.60724 (0.9158)	I (2)
GRT Rate	28.1301 (0.0017)	-------	I (0)	33.3979 (0.0002)	---------	I (0)
FDI	0.00378 (1.0000)	27.9792 (0.0018)	I (1)	4.2E-06 (1.0000)	48.6062 (0.0000)	I (1)

Source: Authors' Computation, 2018. ( ) Figures in parentheses represent P-values

Table III presents the outcomes of unit root tests of GDP, growth rate and FDI with the application of both Panel Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. The reported results from the above tables indicate that growth rare, FDI and real GDP are I(0), I(1) and I(2) variables concurrently. In another words, variables FDI and real GDP possess a unit root, and consequently stationary after first differencing and second differencing simultaneously. However, in an attempt to examine a long run equilibrium relationship among these variables, this study employed Johansen Fisher Panel Cointegration Test.

Table IV. Johansen Fisher Panel Cointegration Test

Trend assumption: Linear deterministic trend
Lags interval (in first differences): 1 1

Unrestricted Cointegration Rank Test (Trace and Maximum Eigenvalue)

Hypothesized	Fisher Stat.*		Fisher Stat.*

No. of CE(s)	(from trace test)	Prob.	(from max-eigen test)	Prob.
None	21.72	0.0166	26.28	0.0034
At most 1	4.631	0.9145	5.857	0.8271
At most 2	3.069	0.9798	3.069	0.9798

* Probabilities
are computed
using asymptotic
Chi-square
distribution.

Individual cross section results

Cross Section	Trace Test Statistics	Prob.**	Max-Eign Test Statistics	Prob.**
Hypothesis of no cointegration				
1	26.5205	0.1139	19.9611	0.0722
2	26.5205	0.1139	19.9611	0.0722
3	26.5205	0.1139	19.9611	0.0722
4	26.5205	0.1139	19.9611	0.0722
5	26.5205	0.1139	19.9611	0.0722
Hypothesis of at most 1 cointegration relationship				
1	6.5594	0.6294	6.4455	0.5567
2	6.5594	0.6294	6.4455	0.5567
3	6.5594	0.6294	6.4455	0.5567
4	6.5594	0.6294	6.4455	0.5567
5	6.5594	0.6294	6.4455	0.5567
Hypothesis of at most 2 cointegration relationship				
1	0.1139	0.7357	0.1139	0.7357
2	0.1139	0.7357	0.1139	0.7357
3	0.1139	0.7357	0.1139	0.7357
4	0.1139	0.7357	0.1139	0.7357
5	0.1139	0.7357	0.1139	0.7357

**MacKinnon-Haug-Michelis (1999) p-values

Source: Authors` Computation, (2018)

Johansen Fisher Panel Cointegration Test was estimated and its results were presented in the table above. The reported results show that we have the presence of two cointegrating vectors in the systems. Taken a critical look at both the trace statistics and the maximal eigenvalue statistics one could establish that the system possesses two cointegrating vectors in the model (at a lag interval of 1 to 1. This implies that the variables of interest namely, FDI, growth rate and economic growth in the South Asian economies possess a long run equilibrium relationship with one

another, though the variables might adjust to short run disequilibrium via the same model. This finding supports the conclusion from the works of Zhang (2001) and Mutasque (2011).

Table V. Pairwise Dumitrescu Hurlin Panel Causality Tests

Sample: 1990 2017

Lags: 4

Null Hypothesis:	W-Stat.	Zbar-Stat.	Prob.
FDI does not homogeneously cause GRT	3.46518	-0.63393	0.5261
GRT does not homogeneously cause FDI	1.00795	-1.98821	0.0468
RGDP does not homogeneously cause GRT	6.72328	1.16175	0.2453
GRT does not homogeneously cause RGDP	5.75341	0.62722	0.5305
RGDP does not homogeneously cause FDI	1.41927	-1.76151	0.0582
FDI does not homogeneously cause RGDP	7.39708	1.53311	0.1252

Source: Authors` Computation (2018)

The table above shows that estimated results from the panel Granger causality test. This test was carried out to establish the nature of feedback effect that exists among the variables of interest in this study. Consequently, it could be validated that there is unidirectional causality which runs from growth rate to FDI inflow in the South Asian sub region. Similarly, the study also confirms that a unidirectional feedback effect exists from economic growth to FDI inflow in the selected countries. This confirmed the submission of Chakraborty and Basu (2002) and contradicted the finding of Chang (2007) who discovered a contradictory result among developing economies. However, there is no granger causality between economic growth and growth rate in the studied economies. The implication of these results is that the market size and the growth rate of these countries are important variables that propel the inflows of cross border investment in this sub region.

4. Conclusion and Recommendation

In this study, we examined a long run equilibrium relationship that exists between FDI, growth rate and economic growth in the developing countries of South Asia

from 1990 to 2017 with the application of Johansen Fisher Panel Cointegration and Pairwise Dumitrescu Hurlin Panel Causality Tests. Consequently, the results that originated from this paper could be summarized as follows: there is an existence of a long run equilibrium relationship between these important economic variables FDI, growth rate of economy and economic growth in the developing countries of South Asia within the period under consideration. The economic implication of this finding is that FDI, growth rate and economic growth possess a great tendency to converge in the long run in these countries. However, the market size and the growth rate of the sub regional economies are the major variables among others that causing the inflows of cross border investment in these countries. It is important to state that as market size expands in this sub region, the growth rate rises and consequently brings about further inflows of FDI to the sub regional economies in the long run. Moreover, there is an existence of unidirectional causality running from both growth rate and economic growth to FDI. This implies that whenever the target of the policy makers in these economies is to facilitate the sporadic inflows of foreign capital, expanding the market size and manipulating the rate of economic growth would induce an increase in FDI inflows in the long run. Finally, the important findings that emerged in this work made this paper to recommend the following vital policy for policy makers, investors, financial institutions regulators and future researchers. Therefore, the policy makers in the developing countries of South Asia should come up with the strategic policy measure that will expand the market size and ensure a sustainable growth rate in this sub region.

5. Reference

Aderemi, T.A., Abalaba, B. P., Ebere C. E., & Ojelade, L. O. (2018:1). Comparative Analysis Approach to Foreign Direct Investment and Economic Growth in Emerging Economies (1990-2017). *Saudi Journal of Economics and Finance*, Vol. 2, No. 5, pp. 263-269.

Aderemi, T. A., Aberu, F. Kalejaiye, T. G. & Jolayemi, L. B. (2018:2). Foreign Direct Investment Inflows and Economic Growth: When Would Tiger Slay Lion? *Journal of Arts, science and Commerce*, Vol. 10, No. 4, pp. 27-34.

Agrawal Gaurav & Aamir Khan, Mohd. (2011). Impact of FDI on GDP: A Comparative Study of China and India. *International Journal of Business and Management*, Vol. 6, pp. 71-79.

Atique, Z., Ahmad, M. H., & Azhae, U. (2004). The impact of FDI on Economic Growth under Foreign Trade Regimes: A Case Study of Pakistan. *The Pakistan Development Review*. , 43(4), pp. 707-718.

Azam, M. (2010). An Empirical Analysis of the Impacts of Exports and Foreign Direct Investment on Economic Growth in South Asia. *Interdisciplinary Journal of Contemporary Research Business*, Vol. 2, No. 7, pp. 249-58.

Bimal, S. (2017). Determinants of Foreign Direct Investment in South Asia: Analysis of Economic, Institutional and Political Factors. *Journal of South Asian Studies*, Vol. 5, No. 1, pp. 1-11.

Chang, Shu Chen (2007). The Interactions among Foreign Direct Investment, Economic Growth, Degree of Openness and Unemployment in Taiwan. *Applied Economics, Vol.* 39: pp. 1647-61.

Chakraborty, C. & Basu, P. (2002). Foreign Direct Investment and Growth in India: A Cointegration Approach. Applied economics, Vol. 34, No. 9, pp. 1061-1073.

Carkovic, M. & Levine, R. (2002). *Does foreign direct investment accelerate economic growth?* In *Does Foreign Direct Investment Promote Development?* (Eds.) T. Moran, E. Graham and M. Blomstrom, Washington, DC, pp. 195–220.

Dickey, D. A. & Fuller, W. A. (1981). Likelihood Ratio Tests for Autoregressive Time Series with a Unit Root. *Econometrica,* Vol. 49, pp. 1057 – 1072.

Dumitrescu, E.-I. & Hurlin, C. (2012). Testing for Granger Non-causality in Heterogeneous Panels. *Economic Modelling,* Vol. 29, pp. 1450-1460.

Falki, N. (2009). Impact of Foreign Direct Investment on Economic Growth in Pakistan. *International Review of Business Research Papers*, 5 (5), pp. 110-120.

Frenkel, M. Funke, K. & Stadtmann, G. (2004). A Panel Analysis of Bilateral FDI Flows to Emerging Economies. *Economic System*, Vol. 28, pp. 281-300.

Hudea (Caraman), O. S. & Stancu, S. (2012). Foreign Direct Investments, Technology Transfer and Economic Growth: A Panel Approach. *Romanian Journal of Economic Forecasting,* Vol. 15, No. 2, pp. 85-102.

Johansen, S. & Juselius K. (1990). Maximum Likelihood Estimation and Inference on Cointegration with Applications to Demand for Money. *Oxford Bulletin of Economics and Statistics* Vol. 52, pp. 169-210.

Kim, D.D. & Seo, J.S. (2003). Does FDI Inflow Crowd Out Domestic Investment in Korea. *Journal of Economic Studies* Vol. 30, No. 6, pp. 605-22.

Minhas, A., & Ahsan, A. (2015). An empirical analysis of foreign direct investment in Pakistan. *Studies in Business and Economics*, Vol 10, No. 1, pp. 5-15.

Mallick, Sushanta & Tomroe Moore (2008). Foreign Capital in a Growth Model. *Review of Development Economics* Vol.12, pp. 143-59.

Motalleb, K.A., & Kalirajan, K. (2010). Determinants of Foreign Direct Investment in Developing Countries: A Comparative analysis. *ASARC Working Paper* 2010/13.

Phillips, P. C. & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika*, Vol. 75, pp. 335-346.

Sahoo, P. (2006). Foreign Direct Investment in South Asia: Policy, Trends, Impact and Determinants. *ADB Institute Discussion* Paper No. 56.

Tiwari, A. K., & Mutascu, M. (2011). Economic Growth and FDI in Asia: A Panel Data Approach. *Economic Analysis and Policy*, Vol. 41, No. 2, pp. 173-188.

Xing, Y. (2006). Why is China so Attractive for FDI? The Role of Exchange Rates. *China Economic Review*: Vol. 17, pp. 198– 209.

UNCTAD. (2016). *World Investment Report published by the United Nations on Trade and Investment* available at unctad.org/en/docs/wir2007_en.pdf.{Accessed on August 2018}.

UNCTAD (2018). *World investment Report 2018 published by the United Nations on Trade* andInvestmentavailableatunctad.org.{ Accessed on August 2018}.

Wei, W. (2005). China and India: Any difference in their FDI performances? *Journal of Asian Economics*; Vol. 16, pp. 719–36.

World Bank (2018). *World Development Indicators.* Washington D.C.

Zhang, Kevin Honglin (2001). Does Foreign Direct Investment Promote Economic Growth? Evidence from East Asia and Latin America. *Contemporary Economic Policy* 19: pp. 175-85.