

## How Foreign Capital React in South Asia? A Panel Data Analysis

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### Abstract

The study examines the long run relation among foreign capital inflows (FCI) and per capita income (PCI) for selected South Asian states namely, Pakistan, Sri Lanka, Bangladesh and India by using pool data. Cointegration result indicating FCI and PCI are cointegrated with significant positive relationship. Hausman test confirms, fixed effect is a more appropriate technique for this model, and evidence of robustness report by dynamic ordinary least square and fully modified ordinary least square techniques as initial result. Causality test found causal relation among foreign capital and per capita income and discussed in final section with conclusion.

**Keywords:** Panel Data, Per Capita Income, Foreign Capital Inflows

### 1. Introduction

The world economies and societies are integrated with emerging market's structure. Acs and Preston (1996) argued that economic activities are moving towards globalization and it connect local and international market. Transfer of technology is another important impact of globalization, to maximize production and minimize cost. Stallings (2001) argue that globalization is a way to increase capital flows and build pressure on the government to make stable policies for accelerating economic growth in long run. Fielding and Torres (2006) discussed active development policy with assuring broad distribution of available country resources that pursues high growth. Wagner and Berger (2004) highlights that economic integration has tremendous growth among cross-border trade, but it raised two concerns. It creates gap in living standard, through income inequality among advanced & developing countries, and secondly, it promotes financial volatility. Globalization could encroach by an internal process of generating and accelerating developing economies to increase their income. Generally, researchers have remained debate on this question whether foreign capital inflows cause to increase nation's income.

It is a big challenge to achieve and sustain economic growth with proper utilization of resources, but Ibrahim (2005) believed that globalization can increase capital inflows in developing countries. Stallings (2001) argued, the growth is associated with capital inflows that could affect investment by short run and long run sustainability. Whereas, extremely volatile inflows can encourage growth at short term and medium term, but it can offset during recession due to capital flight. According to Van Bergeijk (1998), yardstick of national income is not easily available but gross domestic product simply converting at market exchange rate. Contrary, Clark *et al.* (1999) argued that economic growth makes sequence of changes in economic environment, to increases real per capita income. According to Malinen (2012), income inequality influence growth rate by savings and consumption.

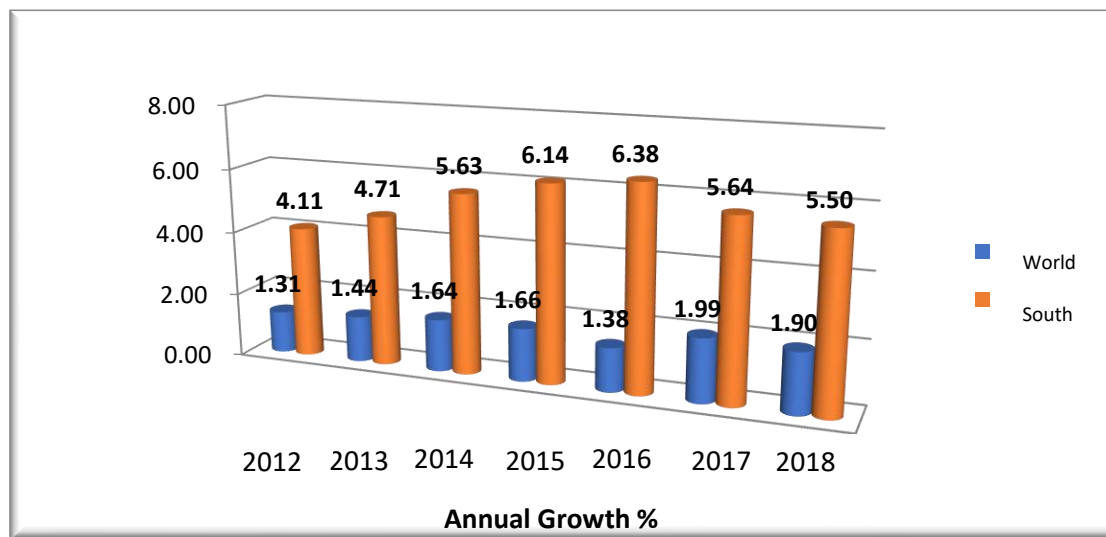
#### 1.1 Importance of South Asian Region (SAR)

South Asian region is like a trade hub for investor, especially after trade liberalization. In SAR, economic growth increases slowly but gradually and this region makes minimum wage workers for advanced countries. Less used of advanced technology creates technological gap in SAR, but lack of good infrastructure is a drawback for developing countries and it make hurdle to enhance industrial production. Contrary, South Asian countries can borrow debts to finance its project and filling gap between inadequate savings and investment. Therefore, foreign inflows help to attain desired growth and availed funds to buy technological equipment to make labors skilled.

The World growth is not as much increasing comparably SAR as figure 1. Economic growth in South Asia increases at faster comparably the World growth during past few years. In this context, FCI in the shape of remittances received US\$ 811.1 billion in SAR, whereas total remittances of the world are US\$ 3908.8 billion. Foreign Direct Investment contributing in various sectors with US\$ 252.1 billion and the World FDI is US\$ 14119.4. Contrary, due to unavailability of funds and technology South Asian countries borrow funds from the local and international institution for their projects.

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**Figure 1: Comparative trend in South Asia and World**

Above trend of per capita income showed variation but considerable better than World trend. Therefore, this paper will help to evaluate the effect of FCI in-context of South Asian countries. Remaining paper consists of few sections in which next section is based on channels and empirical literature, part-section 3 discuss the framework of model, while part-section 4 contains result & estimation and final section concluding paper.

## 2. Theoretical Background

These literature among FCI and PCI lead to accelerate economic growth and number of established theories provided theoretical justification. The theoretical background is discussed below.

### 2.1 Nexus of FCI & PCI

#### 2.1.1 Foreign Direct Investment (FDI)

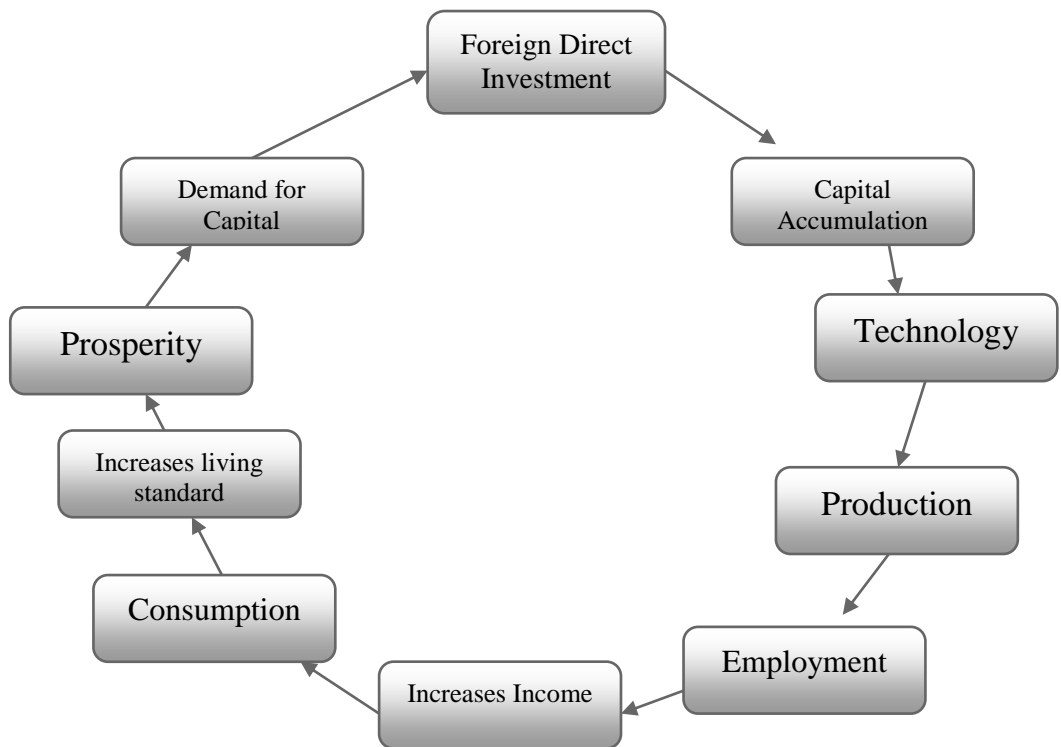
FDI is the common type of financial inflows and it perform important role in developing economies. Therefore, Jawaid and Raza (2012) examined that technology can play a significant role to accelerate production that raise level of employment and Govt. can generate tax revenue. More employment increases per capita income. Rana and Dowling (1988), also claimed country may prosper if domestic savings and consumptions increased. Study of Reisen and Soto (2001) argued, FDI supports to export & technology and enhanced economic growth. Another researcher, De Mello Jr. (1997) examine that FDI encourages growth in long run via technological improvement. The regular inflow of FDI can achieve economic growth and also raise per capita income.

#### 2.1.2 Remittances

Remittance is the amount of money which is sent by one person to their relatives from a country to other country during their work activities. It is financial inflow to stabilized economic growth and improve standard of living. A structure of remittance based on migrant's belonging, spending in host country, how much savings made and how much remit back to their homes. Arslan and Taylor (2012) analyzed, remittances can reduce debt burden, reduced budget deficit, create employment opportunity, and raise purchasing power. Sharif *et al.* (2012) express that remittance develop domestic financial institution and also substitute of foreign investment. At intense situation, FDI and remittance can dominate against foreign debts to stabilize the economy. Developing economies depends more on remittances because it improves balance of payment and minimize the dependency of external borrowing. Solimano (2003) discussed, remittances have four motives such as Altruistic, self-interest loan, repayment and coinsurance whereas Arun and Ulku (2011) argued that remittances have three types Altruistic, self-interest and inter-temporal contractual agreement. Altruistic remittance is depending on aid without any economic situation of migrant.

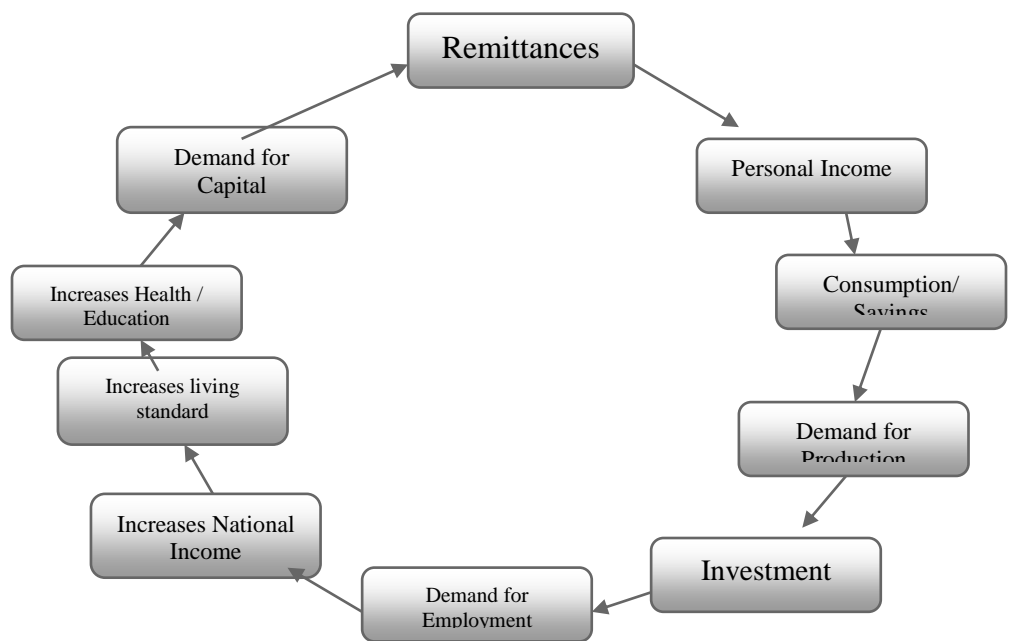
A self-interest remittance is depending on securing inheritance, contractual agreement such as risk sharing, and insurance among migrants & household.

**Figure 2: Theoretical Linkage between FDI and Per Capita Income**



Source: Author's construction in the light of Razzak (2014)

**Figure 3: Theoretical Linkage between REM and Per Capita Income**

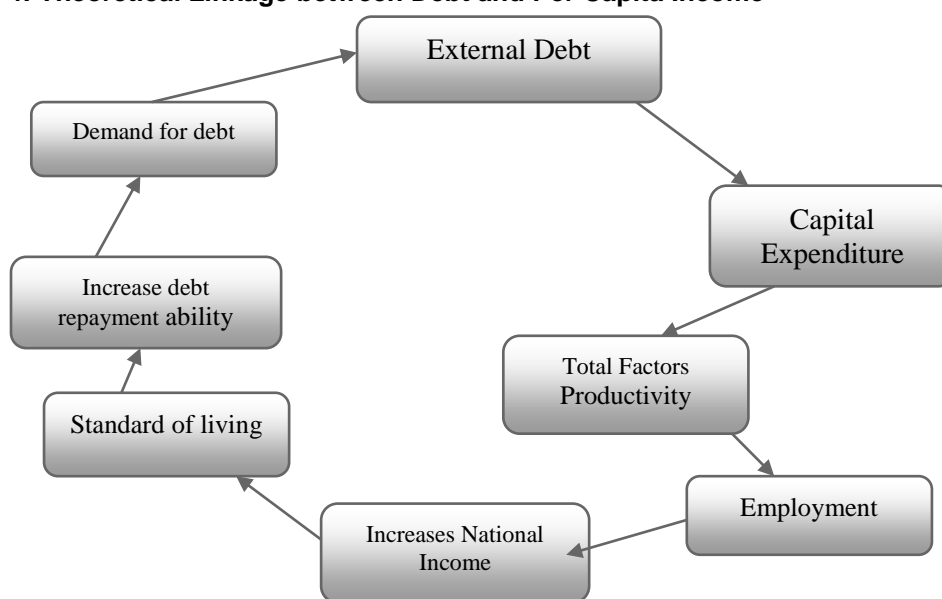


Source: Author's construction in the light of Razzak (2014)

**2.1.3 External Debts**

Debt could impact on growth by capital accumulation & total factor productivity. Debt is a liability of recipient economy to repay, therefore it should be used wisely and significantly otherwise it may worst effect on the economy. When debt-serving cost increases creditors do not look forward because of huge burden of debt, this situation called debt overhang. Generally, investors look fear because if they more produced, they will be taxed more and its force to dishearten national investors and foreign investors thus, its cause to lower the capital accumulation and reduced the productivity (Krugman, 1988). Edwards (1990) argued that if country less relies on external debts it probably mean FDI is playing an important role. Similarly, the government has more funds to pay back their debts if rely on FDI and remittances whereas, inferior government policy get lower the productivity (Pattillo *et al.* 2004). Although debts consider as a liability but its importance increased in recent years specially for developing economies. After 9/11, the world faced shortage of funds with low growth rate, there external debts were played an important role, but Chowdhury (2001) argued that extremely uncertain and unstable economic environment misleads allocation and quality investment in the projects, and slow down productivity.

**Figure 4: Theoretical Linkage between Debt and Per Capita Income**



Source: Author's construction

Above theoretical channels give many possible effects of FCI on PCI but few others factor also effect on PCI such as gross domestic product, inflation, taxes, employment, money supply, exports and imports, etc. The next section is trying to remove ambiguous trend by literature reviews.

## 2.2 Empirical Studies

Following section cover literature review and most of the empirical studies discuss the relationship of FCI and PCI. Lundahl (1985) study the effect of remittance on migrant's real income for recipient country with two different models as traded goods and non-traded goods. It also analyzed that migrants earn more income then it remits back more to home. Stark *et al.* (1986) examine the relation of economic growth and income inequality of less developed countries (LDCs) by taking two Mexican villages. It is argued that remittances giving favorable effect on income inequality hence, United State to Mexico remittance inequality highly correlated than other whereas volume of rural income in both villages depending on migrants' remittance.

Rana and Dowling (1988) study FCI and economic growth, consisting nine Asian developing countries namely China, Burma, Korea, India, Nepal, Phillipine, Singapore, Thailand and Sri Lanka from 1965 to 1982. The two models are used that based on economic growth rate and savings. Further, it is argued that foreign investment gives positive impact growth model while negative in saving.

Lucas Jr. (1990) investigate FCI from rich to less developing countries by taking U.S.A as a rich country whereas India as a poor country and examine the relation between human capital and market imperfections on wage per worker. It is found that rapidly flow of capital from the America to India make it income inequality therefore, resolve the capital inadequacy from rich to poor country. Edwards (1990) investigate attractiveness of capital flows mechanism in 60 less developing countries to finance the different project in the economy. It is argued that economy moves towards international competitiveness, therefore, political stability required to sustain growth. A Large global market that has more directed foreign investment that could increase Per Capita Income and reduce debts burden. Lee (1994) investigates income growth by the open-door policy in two Chinese regions. He argued that degree of development is different in rich and poor regions in china during 1984 to 1990 for 28 to 30 provinces. It is concluded that open door policy gives positive effect significantly at rich coastal region whereas exports growth does not significantly affect in poor region of china due to regional differences.

In 1998, Iqbal and Zahid study the effect of macroeconomic variables on Pakistan's economy during 1960 to 1997. They reported, per capita real income gives positive effect to the openness of the economy and promote growth while external debts give a negative impact. It shows government should encourage domestic source and less rely on external debts for sustainable long-run growth.

Reisen and Soto (2001) examine effectiveness of FCI on economic growth consisting 44 developing economies from 1986 to 1997. It is argued that FDI, portfolio, bonds and banks' lending in LDCs are not self-sufficient therefore LDCs not only rely on national savings but encourage this foreign capital that can lead to long-run growth.

Mah (2002) investigate trade globalization and income distribution in Korea and argued that FDI gives significant impact on GINI coefficient. Whereas, expansion of trade liberalization and FDI lead to raised income inequality in Korea. Carkovic and Levine (2002) investigate about FDI & economic growth and argued that FDI have no significance effect on growth independently by regression analysis whereas, panel data shows significantly affect. It concludes that FDI encourages technology to accelerate economic growth and inflation rate should be controlled.

Hermes and Lensink (2003) analyze precondition of effective financial system of 67 countries. It concludes that FDI give positive impact on per capita growth when financial system of receipt country is good. Because well financial system positively effect on technology. It suggests, the recipient country should reform its financial system to achieved positive effect of foreign direct investment and other inflows.

Choi (2004) examine income convergence by taking 73 countries from 1982 to 1997. It argued that FDI plays vital role income convergence because geographical border and languages are more closing. Due to this FDI is caused by income convergence.

Choi (2006) investigate impact of FDI on income inequality consisting 119 countries from 1993 to 2002 by panel data. It is analyzed that outward FDI gives negative effect rather inward FDI because outward FDI associate with job losses in source country and lead inequality. Contrary, growing countries have more income distribution and bigger countries have less equal income distribution.

Raiser (2007) examine income convergence of 29 provinces of China and argued that regional income inequality has been reduced in recent years. Attention on economic reform such as market improvement flows of capital from richer to a poor area that leads to positive evidence for income convergence. Prasad *et al.* (2007) study FCI and economic growth by consisting of nonindustrial and industrial countries. He argued that FCI have permanent effect on income of the country, similarly non-industrial countries more rely on FCI but economic growth not faster because they do not use full capacity. On the other way, developed economy is absorptive capacity, so countries may increase their capital inflows capacity. Kandil (2011) check the effect of FCI on economic activity consisting 14 developing and 22 advanced countries. FCI vary with macroeconomic performance and FDI have positive effect on current account balance that is better for exports. It proved importance of financial flows for economic growth. Campbell (2012) analyze FDI and economic growth relationship for Barbados by 1979 to 2008 consisting short term and long-term duration. The relation found significant result and when the Govt. wants to

consider long run growth then it can encourage FDI for long term because it gives positive effect on real per capita income.

Aizenman *et al.* (2013) investigate FCI and economic growth relation before and later global financial crisis consisting 100 countries. They argue that financial openness and economic growth shows positive relationship. Foreign direct investment gives significant impact rather other type of capital flow. Ramzan and Ahmed (2014) check external debt and economic growth relation in Pakistan using time series data from 1970 to 2009. Result of ARDL found significant negative effect and also found that bilateral trade component has negative effect than multilateral component. Blanchard *et al.* (2015) examine whether capital inflows are expansionary or contractionary by using time series data consisting 19 countries. It is argued that bond- inflows are appreciation lead to contractionary and non-bond inflows are appreciation but it decreases cost of borrowing lead to expansionary.

Jawaid and Saleem (2017) investigate foreign capital inflows and economic growth of Pakistan consists of 1976 to 2015 using time series. They found significant negative effect of FDI on growth. Result of remittances and external debts found significant positive effect in long run. The government should encourage green-field FDI and minimize charge for fund transfer, secure and save medium of exchange, strong coordination among financial institutions. Government should use debts on development project that make the returns back with minimum cost.

Anan *et al.* (2019) investigate relationship between FDI and total factor productivity consisting south Asian countries<sup>1</sup>. The relationship found significant positive effect. They also argue that south Asian countries promote among regional trade and government makes economic reform via creating more space of FDI in country. Above section open new ways of FCI and PCI this is why above channels and literature need to make framework.

### 3. Model Specification

This section describes the model framework about foreign capital inflow and per capita income in the context of SAR. It is used balanced panel regression using data from the year 1986 to 2013 from the world Bank. Main functions in general form as follows:

$$PCI = f(FDI, REM, EXD) \quad 3.1$$

In the model, PCI is used as GDP per capita as dependent variable, whereas FDI used as foreign direct investment, REM used as personal remittance, EXD used as external debt. The parameter for estimations is developed as an econometric function:

$$\log(PCI)_{it} = \alpha_i + \alpha \log(FDI)_{it} + \beta \log(REM)_{it} + \gamma \log(EXD)_{it} + \mu + \varepsilon \quad 3.2$$

where  $\mu$  and  $\varepsilon$  are used as the error term and  $\alpha, \beta, \gamma$  are used as coefficients of variable.

## 4. Estimation and Results

### 4.1 Panel Unit Root

To examine effect of FCI in SAR with avoiding any spurious regression it is used panel unit root namely, Fisher kind of Augmented Dickey-Fuller (ADF), Levin Lin Chu (2002) and Im Pesaran Shin (2003) statics. Following four variables are checked with constant and constant & trend at level and 1<sup>st</sup> difference is summarized in table 1. Result indicates, all variables are non-stationary at level and stationary at 1<sup>st</sup> difference therefore rejects null hypothesis because variables are unit root. Other test proved data is not sensitive and statistic proved robustness.

**Table 1: Panel Unit Root Statistic**

Variables	ADF				LLC				IPS			
	I (0)		I (1)		I (0)		I (1)		I (0)		I (1)	
	C	C & T	C	C & T	C	C & T	C	C & T	C	C & T	C	C & T
<b>GDP</b>	0.212 (1.00)	3.685 (0.88)	28.847 (0.00)	35.300 (0.00)	9.261 (1.00)	-1.187 (0.11)	-4.750 (0.00)	-5.947 (0.00)	10.510 (1.00)	1.476 (0.93)	-3.762 (0.00)	-4.922 (0.00)
<b>FDI</b>	7.006 (0.53)	9.138 (0.33)	52.802 (0.00)	56.199 (0.00)	-1.086 (0.13)	-0.125 (0.45)	-6.731 (0.00)	-6.344 (0.00)	-0.360 (0.35)	-1.129 (0.12)	-6.206 (0.00)	-7.547 (0.00)
<b>REM</b>	0.177 (1.00)	7.401 (0.49)	48.868 (0.00)	40.990 (0.00)	3.038 (0.99)	0.096 (0.53)	-6.265 (0.00)	-5.598 (0.00)	5.276 (1.00)	-0.165 (0.43)	-6.243 (0.00)	-5.681 (0.00)
<b>EXD</b>	1.667 (0.98)	8.149 (0.41)	103.44 (0.00)	98.181 (0.00)	3.089 (0.99)	1.151 (0.87)	-4.342 (0.00)	-3.221 (0.00)	3.975 (1.00)	0.115 (0.54)	-12.874 (0.00)	-12.420 (0.00)

Source: Author's Estimation

Note: Individual unit root, total balanced observations are 144 and cross sections are 4. Parenthesis considered prob. values

#### 4.2 Panel Cointegration

This section consists of Pedroni (2001) and Kao (1999) statistics based on Engle-Granger to check long run relationship. According to 11 test statistics of Pedroni reported in table 2 highlight the relationship of FCI is cointegrated with PCI, because the result of 8 statistics is significant within dimension and between dimension and reject null hypothesis of no cointegration.

**Table 2: Pedroni Residual Cointegration**

Test	Statistics	Weighted
<b>Within dimension</b>		
Panel v-statistic	2.119 (0.017)	1.993 (0.023)
Panel PP-statistic	-2.287 (0.011)	-2093 (0.018)
Panel ADF-statistic	-2.364 (0.009)	-2.466 (0.006)
<b>Between Dimension</b>		
Group PP-statistic	-2.372 (0.008)	
Group ADF-statistic	-2.534 (0.005)	

Source: Author's Estimation

Note: Automatic lag length selection based on SIC with Newey-west bandwidth selection and Bartlett Kernel

Table 3 represent Kao statistic proved significant result 0.004 with benchmark  $p < 0.05$ .

**Table 3: Kao Residual Cointegration**

Test	t-statistic	Prob.
Augmented Dickey Fuller	-2.654	0.004

Source: Author's Estimation

Note: Individual intercept with SIC automatic selection criterion

#### 4.3 Hausman Hypothesis

Hausman (1978) developed a hypothesis of no correlation. Model of random effect is consistent and efficient under null hypothesis ( $H_0$ ), whereas model of random effect is inconsistent and inefficient under alternative hypothesis ( $H_A$ ). According to these hypotheses, if  $H_0$  is rejected that means  $H_1$  is accepted (that is inconsistent and inefficient) and fixed effect considered the consistent and efficient model. Hausman test chooses an appropriate model to gives robust result and without Hausman test, model may

inappropriate with spurious result. It helps to investigate whether random effect estimations would almost as good (table 4) to choose either random effect is appropriate or fixed effect.

**Table 4: Correlated Random Effect - Hausman Test**

Test Summary	Chi-Square	Degree of Freedom	Prob.
Cross section and period random	6.364	3	0.095

Source: Author's Estimation

Above table 4 proved that random effect model not appropriate because of  $p < 0.10$  that reject null hypothesis and cannot investigate almost good estimations, therefore, fixed effect model appropriate to considered.

#### 4.4 Fixed Effect Model

For panel regression, appropriate choice between the random effect and fixed effect model involves in determining whether regression is correlated with an individual effect. Due to consistent, even the estimators are correlated with the individual effect, fixed effect model has an advantage over random effect. The result of panel regression (table 5) represents non-negative coefficient within  $p < 0.1$  that proved positive significant relationship. Whereas coefficient of constant is negative significant effect, that mean other than focus variable having negative relation with PCI in SAR. The overall model explains with adjusted  $R^2$  about 97 percent with considering F-statistic 120.25 (0.00) that reject null hypothesis, foreign capital inflow does not cause to per capita income.

**Table 5: Fixed effect Regression**

Variables	Coefficient	t-stats	Prob.
C	-9.772	-30.151	0.000
FDI	0.017	1.680	0.096
REM	0.112	3.597	0.000
EXD	0.177	4.945	0.000
<b>Effect Specification</b>			
Adjusted $R^2$	0.97		
F-statistic	120.25		
Prob.	(0.000)		
Durbin-Watson	0.64		
<b>Source:</b> Author's Estimation			
Note: Total panel balanced observations are 112			

#### 4.5 Sensitivity Analysis

Pooled Fully Modified Ordinary Least Square (FMOLS) and pooled weighted Dynamic Ordinary Least Square (DOLS) methods are used by Phillips and Moon (1999) and Mark and Sul (1999) respectively. These estimators are used to check robustness of panel estimation. FMOLS and DOLS results proved (table 6) significant positive long run relationship between FCI and PCI as initial result found.

**Table 6: FMOLS and DOLS test statistics**

Variables	FMOLS		DOLS	
	Coefficients	Prob.	Coefficients	Prob.
FDI	0.021	0.054	0.007	0.093
REM	0.160	0.000	0.170	0.000
EXD	0.255	0.000	0.293	0.000

Source: Author's Estimation

Note: Pooled weighted DOLS with 2 lags and 1 lead

#### 4.6 Granger Causality



For causation and direction between two variables can be found by Granger Causality test (Granger, 1969) while Jones (1989) state if selection method of optimal lag length is compared with adhoc selection than optimal lag length selection is determined. Similarly, table 7 indicate causal relationship between FCI & PCI is bidirectional and unidirectional with different lags.

**Table 7: Granger Causality test Statistics**

Null Hypothesis	Lags	F-stats	Prob	Results
FDI does not Granger cause PCI	1	5.300	0.023	Unidirectional
PCI does not Granger cause FDI	1	0.017	0.894	No directional
REM does not Granger cause PCI	1	17.807	0.000	Unidirectional
PCI does not Granger cause REM	1	0.229	0.633	No directional
REM does not Granger cause PCI	5	2.297	0.055	Bidirectional
PCI does not Granger cause REM	5	2.289	0.053	Bidirectional
EXD does not Granger cause PCI	1	3.272	0.073	Unidirectional
PCI does not Granger cause EXD	1	2.136	0.123	No directional

Source: Author's estimation

## 5. Conclusion

This study used panel regression to investigate long term relationship among FCI and PCI for South Asian countries. It is argued foreign capital can provide important support to economic growth in SAR but composition of capital flow is crucial. Results indicating FCI and PCI are cointegrated in SAR with the evidence of Pedroni and Kao test, and also found positive significant long-run relationship. Coefficients of all variable are non-negative with  $p < 0.1$  in two-way fixed effect, whereas Hausman hypothesis rejected because FCI does not cause PCI. FMOLS and DOLS regression proved robustness with positive significant relationship.

Policy changes are needed to enhance benefits of foreign capital according to globalization changes in SAR. Inflows may cause instability in government policies and government should aware about, how and where these inflows are to be used in long run effectively. The government also ensure those projects that financed by foreign capital should be wisely invested. Heavily depends on external debts is not fruitful for South Asian countries because it may have inverse impact through crowding-out effect, but this region can avail debt facility for availing advanced technology for their development projects, and also strengthen large-scale production. This large-scale production creates employment opportunity that increase government revenue by tax collection.

Efficient use of monetary and fiscal policies in SAR, a way to effective utilization of external resources, and save foreign reserves. Similarly, developed countries can recruit minimum wage workers from SAR and South Asian countries can collect high workers' remittances through proper facilitation. The government can also encourage domestic savings - a way to encourage trade and investment by strengthening the domestic financial institution. This encouragement is the baseline for Small and Medium Enterprises (SMEs) in South Asia. SMEs should support skills acquisition programs, risk measuring management, fiscal & monetary policies and infrastructural facility.

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