



Impact of Capital Inflows on Domestic Investment: Evidence from Panel Data

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Abstract *Investment significance in any country cannot be ignored for its direct and indirect influences on the growth rate of the economy. Foreign capital inflows are one of the major determinants of domestic private investment. Hence, this study analyzes the effect of two kinds of foreign capital inflows, i.e. inward foreign direct investment and inward foreign remittances on domestic investment covering a sample of five South Asian economies from 1976 to 2017. The findings of the study reveal that both types of capital inflows raise the domestic investment and the role of remaining variables on investment is also positive and significant. The study recommended that steps should be undertaken to increase these foreign capital inflows to raise the domestic investment in these countries.*

Key Words: Capital Inflows, Domestic Investment, Foreign Direct Investment

JEL Classification: C23, E2, F21, F24

Introduction

The role of foreign capital inflow is important especially for the economic growth of developing countries which mostly face internal and external deficits. The main sources of foreign capital inflows (hereafter FCI) are inward foreign remittances & inward foreign direct investment (hereafter FDI). Plenty of studies available in the literature under this context [Cooray, 2012; Javid et al., 2012; Hussain & Anjum, 2014] to analyze how FDI affects economic growth and [Balamurali & Bogahawatte, 2004; Gudaró et al., 2010; Hossain & Hossain, 2012] which considered the role of remittances on the growth of the economy.

This present study does not analyze the role of FCI on economic growth (EG) but how these inflows affect domestic investment which determines the growth of the economy through direct and indirect channels is the main emphasis of this study. This topic has not received due importance in the literature. As far as FDI is concerned, it may substitute or augment domestic investment.

Bokhari and Shah (2019) have examined the role of private domestic investment (PDI) on growth relative to FDI for five South Asian economies by employing a panel data set From 1975-2017. The findings show that in South Asian country cases Private

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domestic investment has a direct significant influence on EG as well. Further results suggested that in the south Asian country case PDI effect on EG exists only if these countries invest in manufacturing or primary sector.

For boosting domestic investment, FDI can play a positive role in boosting domestic investment if it is a source of incentive to domestic investment. Contrary to this, it can replace domestic investment if it creates competition in the host country market as small firms cannot compete for multinational corporations or the local market does not have absorptive capacity [[Agosin and Mayer, \(2005\)](#); [Ali et al.,\(2015\)](#) & [Hanif and Jalaluddin, \(2013\)](#), [Eregha\(2012\)](#), [Fahinde, et al., 2015](#)] for both crowdings in and out effects of FDI, respectively. Similarly, remittances' role in determining domestic investment may also vary depending on the preferences of people for consumption expenditure and investment. Foreign remittances can lead to more investment if the recipients use a major portion of them for investment purposes. This can happen if their basic needs are already being met. However, if these remittances are a main source of recipients' consumption expenditure, then they may lead to more consumption ([Khan et al., 2007](#); [Yasmeen et al., 2011](#); [Încaltărău and Maha, 2012](#)).

[Taran and Hoang \(2019\)](#) estimated the FDI influences on other important factors such as domestic investment capital, human resource, retained workers rate on EG for Vietnam. The estimation results specify that FDI, domestic investment capital have a significant direct effect on EG. Whereas, retained workers do not have a significant influence on EG in Vietnam.

[Jude, \(2019\)](#) empirically analyzed the linkages between FDI and domestic investment by covering a sample of ten (CEECs) countries from 1995–2015. The findings indicate that in short term period, FDI crowd out the domestic investment and in the long run, crowd in the domestic investment. Whereas, Mergers and acquisitions not significantly affected the domestic investment. Although, financial development appeared to alleviate the stress of crowding out and encourage the crowding-in effect for mergers and acquisitions.

[Li & Leo \(2019\)](#) empirically examined the FDI spillover effect on productivity growth at firm- level for England. By employing the data of 2198 firms covering the duration of 2004-2011. The study results suggested that there are well-built further spillovers from FDI taking place, from the linkages among foreign affiliation and their downstream sectors local consumers in the West Midlands. Whereas, we have found the zero spillover effect from horizontal and backward connection.

The current study's main aim is to analyze the impact of FCI on domestic investment which indirectly effect on EG of country. As the rich literature investigated directly the FDI effect on EG, but the limited literature available which examined the influence of FCI on domestic investment. According to the best of researcher knowledge, not any study has been done as before for South Asian economies under this context. Therefore, this study covers this gap and analyzes the effect of FCI on domestic private investment for five South Asian countries covering a sample of 1970 – 2017.

Objectives of the study

This study has the following objectives:

- To investigate whether foreign capital inflows are measured by inward FDI.
- To analyze inward foreign remittances influences domestic investment.

Literature Review

The role of inward FDI and inward foreign remittances in determining the domestic investment is not clear as some studies found it to be negative while others pointed it be negative or ambiguous. Therefore, a review of some of the studies has been discussed as:

Inward FDI and Domestic Investment:

[Baskaya et al., \(2017\)](#) analyze international channel of credit role in turkey in the period from 2005 -2013. The study results show that when capital inflows ratio is higher than a large number of commercial banks who have non-core liabilities which increases their credit chain. Further, [Zhu \(2016\)](#) analyzed the relationship between FDI and domestic investment in Pakistan and India. The study results explained that FDI has a complementary relationship with domestic investment in India. On the contrary, it has a substitute relationship for Pakistan in the long term. Therefore, FDI complementary effect is elastic in India and it has a substitute effect which is inelastic in Pakistan.

[Fahinde et al., \(2015\)](#) examined the crowding-in and out impact of FCI on domestic investment in WAEMU from 1996 to 2011. Three categories of the capital inflows, i.e. migrant's remittances, official assistance for development (ODA), and FDI were considered. Empirical results by using the generalized moments method (GMM) exposed that the impact of remittances was not significant whereas ODA and FDI had a crowding-out effect in both short and long run on domestic investment within the region of WAEMU. Later on, [Ali et al., \(2015\)](#) analyzed the active linkages among FDI, public and domestic private investment in Pakistan from 1977 to 2011. The long-run analysis was carried out by employing an autoregressive distributed lag model which reveals that FDI has a direct significant influence on domestic investment. Moreover, study results revealed that FDI has a complementary relationship with domestic private investment.

[Hanif and Jalaluddin \(2013\)](#) analyzed the inward FDI effect on domestic investment from 1970 to 2011 for Malaysia by employing the Johansen co-integration technique. The results demonstrate that long term relationships hold among variables and the model converges towards long-run equilibrium, respectively. Furthermore, results declared that inward FDI crowded out the domestic investment.

[Eregha \(2012\)](#) investigated the linkages among FDI and domestic investment for 10 selected ECOWAS countries covering a sample of 1970-2008. The study results reveal that there was a long-term as well as two ways causal relationship exists among FDI and domestic investment. The results reveal that FDI frequently crowded out the domestic investment.

Similarly, [Lautier and Moreaub \(2012\)](#) analyzed the effect of domestic investment on FDI for 68 selected developing countries over the period of 1984-2004. The empirical analysis was done by using the OLS. The results by employing the overall sample revealed that the effect of domestic investment and lagged domestic investment in attracting new FDI was positive and this finding was robust to different specifications. Moreover, study results reveal a direct significant impact of domestic investment on inflows of FDI in the host economies.

[Adhikary \(2011\)](#) examined the linkages among FDI, capital formation, trade openness and EG in Bangladesh over the period of 1986-2008. Empirical analysis results Show a uni-directional long-run relationship from FDI, capital formation and trade

openness to EG. The capital formation and FDI impact on EG were positive. However, an inverse relationship found among trade openness and EG.

Inward Foreign Remittances and Domestic Investment

[Tahir et al.,\(2015\)](#) examined a linkages between external determinants and EG in the Pakistani economy. By employing a sample of 1977- 2013 and time series econometric methodology the estimated results revealed that the external determinants such as FDI, foreign remittances have a significant direct effect on the EG of Pakistan.

[Ali and Khan \(2014\)](#) in their study tested, whether remittances among small scale farmers contribute to investment in the agriculture sector or not. For this purpose, primary data consisting of a sample of 250 migrants in the district of Peshawar and 250 respondents from their families living in Chitral were used. By using T-Test statistics, highly significant relationships were found between the yearly amount spent after migration and purchasing quality inputs in agriculture, between after migration annual amount spent and income of the household, between yearly expenditures after migration and livestock and between after migration monthly amount spent and fuel expenditures.

[Simiyu \(2013\)](#) analyzed the remittances effects on household expenditures in Kenya. Primary data was collected from 295 households in Kenya's provinces Rift Valley and Nyanza. The sampled households were surveyed in 2007 and again in 2009. By employing the two-wave panel data set and methodology of fixed-effects, the empirical results revealed that the remittances effect on education expenditures were negative and direct relationship with food, health, and other expenditures. The study results concluded that in Kenya remittances are mostly spent on the instant needs of consumption. It occurred because the small amounts of remittances received by the recipient households and expenses of education are very high as compared to that of basic needs in Kenya.

[Încalțărău& Maha \(2012\)](#) explored the impact of the remittance of investment and consumption for Romania. By specifying two models with household consumption and investment as dependent variables, respectively, empirical analysis was done. OLS was employed for hypothesis testing. The results showed that although remittances had increasing impact on household consumption as well as investment, yet impact of remittances on investment was more than that on consumption. The reason explained for this was that the study used data on remittances only which are transferred through formal channels and are mostly used for investment purposes.

[Yasmeen et al., \(2011\)](#) examined the effect of worker remittances on private investment and consumption from 1984 to 2009 in Pakistan. Two models were employed for empirical analysis. The explained variable of first and second models was a private investment and total consumption, respectively. The explanatory variables of both models were worker remittances and gross domestic product. Empirical analysis through OLS showed that worker remittances had a direct relation with private investment and total consumption. The study results concluded that remitting policies should be made more formal and worker remittances should be channelized to private investment.

[Dzansi \(2011\)](#) investigated the nexus of remittances and domestic investment by considering the financial and institutional development role. The sample contained data from 79 developing countries from 1995 to 2005. The findings revealed that the effect of

remittances on investment was statistically insignificant by employing the static panel data technique of fixed-effect while the empirical results obtained from the dynamic panel data technique show that GMM has a direct significant influence of remittances on investment of home country. But the remittances effect on local investment varied inversely with both financial development and institutional quality by using GMM and fixed-effect methods.

[Gheeraert et al., \(2010\)](#) built a theoretical model by embracing the two different effects of financial sector development (FSD), transaction cost effect (FSDtc) and openness effect (FSDopen) by stimulating remittance's impact on investment of home country. For analysis, the study employed 5-yearly average data of 114 developing countries from 1970 to 2004 and employed fixed effects method. Assets of deposit money banks were used as the indicator of FSDtc, FSDopen was measured by the Chinn-Ito index of capital openness and total credit to the private sector was used to capture the overall impact of FSD. Empirical results indicated that when FSD was low, remittances were more effective in stimulating home country investment and became less effective to stimulate domestic investment when the FSD level increased. The rationale for these phenomena was the existence of a robust quadratic impact of FSD which depicted the dominance of FSDtc effect at lower levels of FSD and FSDopen effect at upper levels of FSD.

The review of the literature shows that nothing can be concluded about the role of these capital inflows for domestic investment without empirical investigation.

Hypothesis Testing

Following hypotheses to be tested in this study:

- H₁**: Inward foreign direct investment complements domestic investment.
- H₂**: Inward foreign remittances lead to higher domestic investment.

Data and Methodology

The current study used the panel data set covering the span from 1976 to 2017 for five South Asian economies consisting of Bangladesh, India, Nepal, Pakistan and Sri Lanka. The data of all variables were extracted from the world development indicator (WDI).

Model

Following models were used for experiential analysis:

$$GCF_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 REMIT_{it} + \beta_3 TO_{it} + \beta_4 GDPG_{it} + \varepsilon_{it} \text{----- (1)}$$

$$GFCE_{it} = \gamma_0 + \gamma_1 FDI_{it} + \gamma_2 REMIT_{it} + \gamma_3 TO_{it} + \gamma_4 GDPG_{it} + \varepsilon_{it} \text{----- (2)}$$

In equation 1, **GCF_{it}** is the dependent variable of this model taken in the form of gross capital formation as a % of GDP. It has been used by previous studies such as Agosin & Mayer (2005), Adhikary (2011), Baldé (2011), Dzansi (2011), Yasmeen et al. (2011), Eregha (2012), Lautier & Moreaub (2012) and Fahinde et al. (2015).

GFCE_{it} is the dependent variable of the model (2) taken as Gross fixed capital formation as a % of GDP.

FDI_{it}: taken as net FDI in GDP percentage form which has been previously used by Agosin & Mayer (2005), Adhikary (2011), Eregha (2012), Lautier & Moreaub (2012) and Fahinde et al., (2015).

REMIT_{it}: is personal foreign remittances received as a percentage of GDP. Gheeraert et al. (2010), Baldé (2011), Dzansi (2011), Încalțărău & Maha (2012), Ali & Khan (2014), Fahinde et al., (2015) and have taken this variable.

TO_{it}: denotes trade openness. Some of the studies which have used this variable are Adhikary (2011), Baldé (2011), Dzansi (2011), Eregha (2012) and Fahinde et al. (2015).

GDPG_{it} : GDP growth (annual %) taken for economic growth proxy. Some of the previous studies used the term economic growth as a determinant of investment are Agosin& Mayer (2005), Adhikary (2011), Yasmeen et al. (2011), Eregha (2012), Încalțărău& Maha (2012), Fahinde et al. (2015).

“**e_{it}**” stands for error term, “**i**” stands for cross sections, i.e. countries (i = 1, 2,3,..,5) and “**t**” stands for the duration of time, i.e. years (1976, 1977,....., 2017).

Data Analysis

Before moving towards empirical analysis, data were analyzed through descriptive analysis.

Table 1. Descriptive Statistics

Variables	Mean	STD	Min	Max
GCF	23.23794	5.756952	13.98976	38.93603
GFCF	21.41649	4.799960	12.38976	33.64178
FDI	0.695002	0.727415	-0.098375	3.668323
REMIT	5.375391	4.776798	0.360806	29.04195
TO	40.80656	19.88421	12.00868	88.63646
GDPG	5.080257	2.130081	-5.238183	10.25996

Table 1 results describes the basic stats of the selected variables such as: on average GCF is 23, GFCF is 21, FDI is 0.69, remittances 5.37, trade openness is 40 and GDP growth is 5.08. Moreover, results reveal that higher variation found in trade openness relative to other selected variables.

Table 2. Correlation Matrix

	GCF	GFCF	FDI	REMIT	TO	GDPG
GCF	1.0000					
GFCF	0.8808	1.0000				
FDI	0.3966	0.4474	1.0000			
REMIT	0.4173	0.1248	0.0326	1.0000		
TO	0.4332	0.4658	0.4312	0.2886	1.0000	
GDPG	0.3420	0.3790	0.2208	- 0.0010	0.0792	1.0000

Table 2 shows the correlation matrix of all selected variables and explained that each selected explanatory variables have a direct relationship with both dependent variables of the study.

Empirical Estimation

As it was necessary to select the suitable approach for the estimation of the model, therefore, different diagnostic tests were employed. F-test was employed to choose the better model such as Pooled OLS vs fixed effects model(FEM), Breusch and Pagan Lagrangian multiplier (LM) test were employed to select the pooled OLS vs random effects model (REM) and Hausman test was used to select among fixed vs random effects models.

Table 3. Diagnostic Tests for Model 1

		Model 1	
F-test	F		86.856056
	Prob. > F		0.0000*
BP LM test	χ^2		1130.00
	Prob. > χ^2		0.0000*
Hausman test	χ^2		347.424224
	Prob. > χ^2		0.0000*
Wald test for paired heteroskedasticity	χ^2		11.88
	Prob. > χ^2		0.0365**
Wooldridge test for autocorrelation	F		9.481
	Prob. > F		0.0370**

* & ** 1% and 5% significance level

Table 3 shows the diagnostic test results. F-test null hypothesis pooled OLS versus FEM model has been rejected. Therefore, its better to select the FEM.

However, Breusch Pagan & LM test null hypothesis pooled OLS is preferable than REF model was rejected. It is concluded that REM is better than pooled model.

Further, the Hausman test null hypothesis is that REM is suitable instead of FEM was also rejected which indicating that FEM is the better choice.

Therefore, it was decided to employ fixed effects for empirical analysis. But before doing so, Wald test and Wooldridge test were also employed to examine that model suffering problem of heteroskedasticity and autocorrelation or not. The null hypotheses of respective diagnostic tests i.e. no heteroskedasticity and no autocorrelation hypotheses were rejected significantly pointing towards the existence of both of these

issues in the Model. To solve the issue of heteroscedasticity and autocorrelation, the estimated model by using the white period standard errors.

Table 4. FEM Estimation for Model 1

Dependent Variable: GCF (Domestic Investment)				
Variables	Coefficients	SE	t-Stat	P-Value.
FDI	1.621659	0.453251	3.577839	0.0005*
REMIT	0.575031	0.037296	15.41798	0.0000*
TO	0.200392	0.057374	3.492740	0.0006*
GDPG	0.316495	0.115905	2.730649	0.0070*
C	9.129696	1.549594	5.891671	0.0000*
R ²			0.821049	

* & ** show the 1% and 5% significance level.

Table 4 shows the empirical results found in the fixed-effects model. The estimations showed in foreign inflows, i.e. foreign remittances and FDI have a significant and direct influence on domestic investment which implied that FCI was complementing domestic investment, not replacing it.

Robustness of Results

Table 5. Diagnostic Tests (Robustness Test) for Model II

F-test	F	82.003451
	Prob. > F	0.0000*
BP LM test	χ^2	1053.15
	Prob. > χ^2	0.0000*
Hausman test	chi ²	328.013802
	Prob. > χ^2	0.0000*
Wald test for paired wise heteroskedasticity	χ^2	79.55
	Prob. > χ^2	0.0000*
Wooldridge test for autocorrelation in panel data	F	16.235
	Prob. > F	0.0157*

* shows significance level at 5%.

Table 5 explains the diagnostic test for model 2. To do this, the dependent variable of the model taken as GFCF as a % of GDP. Whereas, regressors of the model were kept the same.

The diagnostic tests were carried out as in the previous models such as F-test, Breusch, and Pagan LM and Hausman test showed that still, the appropriate technique for model estimation was FEM. The findings of heteroskedastic and autocorrelation tests showed that this model was also suffering from the problems of heteroskedasticity and autocorrelation. Therefore, FEM was employed with white period standard errors as in model 1.

Table 6. Fixed Effects Model Estimation (Robustness Test) for Model II

Dependent Variable: GFCF				
Variables	Coefficient	SE	T-Stat	P-value
FDI	1.219268	0.544128	2.240773	0.0264**
REMIT	0.224937	0.068157	3.300282	0.0012*
TO	0.193642	0.056564	3.423451	0.0008*
GDPG	0.321816	0.075046	4.288231	0.0000*
C	9.823185	1.694383	5.797498	0.0000*
R ²	0.796868			

*and ** 1 & 5 % significance level

Table 6 results reveal that the FEM estimations for model 2 show that when the dependent variable was changed, i.e. the proxy for domestic investment was taken as GFCF in GDP percentage, the signs of coefficients of independent variables were not changed. This implies that the empirical results found in model 1 are robust.

Results and Discussion

The results of the study explain that the selected independent variables of the model are directly and significantly related to domestic investment. For example, GCF and GFCF as a % of GDP. Inward FDI has a direct significant influence on domestic investment. This result suggests that the nature of inward FDI is augmenting in these countries as it leads to crowding in of domestic investment.

It can be observed commonly that investment in one industry or any other economic activity leads to more investment in other economic activities leading to an overall increase in investment. The complementary relationship between inward FDI and domestic investment as found in the present study supports the results of [Ojapinwa & Odekunle \(2013\)](#). In model 1, as a 1% rise in net FDI inflow leads to raising domestic investment by 1.62 %, whereas in model 2, it leads to increase it by 1.21percent.

As the estimations show that foreign remittances also increase domestic investment and it can be explained by a simple phenomenon that remitting people or their families in their home countries prefer to invest more out of these remittances. It may be either due to the reason that people save and then invest rather than increasing consumption expenditure or their economic needs are being fulfilled previously. Hence, they may use this money for investment. It supports the results found by [Baldé \(2011\)](#), [Dzansi \(2011\)](#), [Yasmeen, et al., \(2011\)](#), [Încaltărău and Maha \(2012\)](#) and [Ali and Khan \(2014\)](#). In model 1, as 1% rise in inward remittances would raise domestic investment by 0.57%, whereas in model 2, it leads to increase it by 0.22%.

Trade openness has a direct significant effect on domestic investment. It may be when exports are increasing. The findings of results are consistent with [Baldé \(2011\)](#), [Dzansi \(2011\)](#) and [Fahinde et al., \(2015\)](#).

The role of economic growth, i.e. GDP growth rate was also found to be supportive as it is clear that higher EG levels can increase domestic investment due to an increase in aggregate demand. These results are consistent with ([Dzansi, 2011](#); [Yasmeen et al., 2011](#); [Eregna, 2012](#)).

The main independent variable of concern is FCI taken as inward FDI and inward foreign remittances. The findings point that both of these variables have a positive impact on domestic investment.

Conclusion and Recommendations

The study concludes that the role of inward FDI and inward foreign remittances in determining domestic investment was supportive or adverse in selected South Asian economies. The results reveal that crowding in the role of inward FDI for domestic investment in these countries. Similarly, inward foreign remittances induce domestic investment. The role of other supporting variables i.e. trade openness and EG is positive and significant for domestic investment. In the next step, the robustness of the estimated model was checked by substituting the proxy for domestic investment, i.e. by taking GFCF. The independent variables were kept the same. All of the estimation steps were repeated as in model 1. The estimated results showed that the sign of coefficients showed that the estimations in model 1 were robust as their signs did not change.

- As inward FDI and inward foreign remittances boost domestic investment in these selected countries, therefore, results will be undertaken by these countries to encourage inward FDI and inward foreign remittances to boost domestic investment.

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