



Capital Inflows and Economic Growth: Empirical Evidence from India

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Abstract:

In view of the debate that whether financial globalization is beneficial for developing countries and whether the financial flows to EMEs help in their growth, this paper investigates empirical evidence from India by testing causal relationship between capital inflows and economic growth in India for quarterly data from 1996 to 2009. The objective of the study is to examine the causal and long run relationship between Real GDP growth rate and various forms of capital inflows (FII, FDI, Remittances) by using the Granger causality test and Engle-Granger co-integration test respectively.

Keywords: Capital, Causal, Granger, Growth

1. Introduction

Over the last two decades international flows have become prominent in economic theory, there is wide literature which analyze the impact of these flows on a countries' growth rate especially in the developing world which has witnessed these huge inflows in the form of FII, FDI and Remittances. However the causal relation or the long term co integration between these variables and economic growth is open to debate and there is no consensus with the direction of causality.

2. Literature Review

The literature surrounding this issue are..

An analysis by Samad Abdus(2011), indicates bidirectional causal relation between GDP and FDI for seven countries, namely, Bolivia, Columbia, Singapore, Indonesia, India, Thailand, and Pakistan. The F-statistics for these countries suggest that the null hypothesis of bidirectional Granger causality cannot be rejected at a conventional level of significance. Both GDP and FDI interact with each other in providing feedback for these countries.

Balasubramanyam, Salisu and Sapsford (1996) in their work emphasize trade openness as being crucial for acquiring the potential growth impact of FDI.

Another paper by Ericsson and Irandoust (2001) examines the causal effects between FDI growth and output growth for four OECD countries applying a multi-country framework to data from Denmark, Finland, Norway and Sweden. Unlike the other studies, the authors fail to detect any causal relationship between FDI and output growth for Denmark and Finland. They suggest that the specific dynamics and nature of FDI entering these countries could be responsible for these no-causality results.

Basu, Chakraborty and Reagle (2003) addressed the question of the two-way link between FDI and growth. Allowing for country-specific co-integrating vectors as well as individual country and time fixed effects they find a co-integrated relationship between FDI and growth using a panel of 23

countries.

Chakraborty and Basu (2002) examine the causality between FDI and output growth in India. Utilizing annual data from 1974-1996, they find that the real GDP in India is not Granger-caused by FDI and the causality runs more from real GDP to FDI.

Javaid, Attari, Kamal, Attaria (2008) in their paper analyzes the annual time series data from 1981 to 2009 in Pakistan. In the formal investigation, the stochastic properties of variables are examined, and the co-integration regression indicates the presence of long run equilibrium relationship between FDI and growth rate. Regarding the cause and effect relationship in case of Pakistan, Granger causality test suggest that FDI does not cause GDP.

Ray (2012), in her work on India uses time series data on FDI and real GDP from 1991-2010 to confirm an existence of long run equilibrium relationship between the two as confirmed by the Johansen co-integration test results. The Granger causality test finds the presence of uni-directional causality which runs from economic growth to foreign direct investment.

Bhattacharya and Bhattacharya, (2011) try to investigate whether the volume of merchandise trade and FDI inflows influences economic growth. The period of the study is 1996-97:Q1 to 2008-09:Q3. After investigating the stationarity of the variables, co-integration analysis has been conducted followed by VECM analysis and Granger Causality Test. The variables are I(1) processes. While unidirectional causality is observed from merchandise trade to economic growth, feedback causality has been observed between FDI inflows and economic growth.

Mishra, Das, Pradhan (2010) in their paper make an attempt to test the causality between foreign institutional investments and the real economic growth in India over a period 1993:Q1 to 2009:Q2. The Granger Causality test in the VAR framework provides the evidence of bi-directional causality running between these two variables.

Sethi and Sucharita (2010) attempts to explain the effects of private foreign capital inflows (FINV) on some macroeconomic variables in India using the time series data between April 1995 to Dec. 2007. Their study examines the impact of international capital flows on economic growth. The Co-integration test confirms the presence of long-run equilibrium relationships between a few pair of variables like private capital inflows (FINV) and economic growth (IIP as proxy of GDP). The Granger causality test shows bi-directional causality from FINV and growth (IIP).

Siddique, Selvanathan and Selvanathan (2010) in their work, analyse the causal link between remittances and economic growth in three countries, Bangladesh, India and Sri Lanka, by employing the Granger causality test under a VAR framework (Granger 1988). Using time series data over a 25 year period, they found that remittances do lead to economic growth in Bangladesh. In India, there seems to be no causal relationship between growth in remittances and economic growth; but in Sri Lanka, a two-way directional causality is found; namely economic growth influences growth in remittances and vice-versa.

Jawaid, Tehseen, Raza, Ali (2012), in their study, find positive long run relationship through co-integration India, Bangladesh, Sri Lanka and Nepal while significant negative relationship between remittance and economic growth in Pakistan. In this study they also find a unidirectional relationship from remittance to economic growth for Pakistan, India and Bangladesh.

With the above literature as the background following methodology was adopted.

3. Methodology and Results

The objective of this paper is to investigate the direction of causal relationship between FII and economic growth in India, FDI and economic growth in India, Remittances and economic growth in India and Capital Account and economic growth in India. The capital account is taken to check if there are components of capital inflows other than the ones taken by us could be causing any link to the growth rate. The sample period of the present study spans over 1996 (Quarter 1) to 2009 (Quarter 2). This study uses the quarterly time series data on five variables, which are the Net FII investment flow to India, Net FDI inflow to India, Net Remittances (Net Private Transfers), Capital Account Balance and the Real GDP of India. All the data has been sourced from the Handbook of Statistics on Indian Economy, RBI 2011-2012 and all the variables are in Rupees Billion.

For 1996 Q1 to 1999 Q4, the Net Foreign Portfolio investment in India is taken to be the Net FII flow in India. For 2000 Q1 to 2009 Q2 value of Net Foreign Portfolio Investment in India plus Net Portfolio Investment abroad is taken to be the Net FII flows in India.

For 1996 Q1 to 1999 Q4, Net Foreign Direct Investment in India plus Net Foreign Investment in India. For 2000 Q1 to 2009 Q2 sum of Net Foreign Direct Investment in India and Net Foreign Direct Investment Abroad has been used for Net FDI flows in India.

Net Private Transfer used as a proxy of Net Remittances.

Growth Rate of real GDP at factor cost has been used to access economic growth.

To meet the objective of analyzing the casual relationship between the variables defined above, the study employs the Granger causality test in the Vector Autoregressive Regression framework. This necessitates the empirical analysis to be performed in three steps: First, the stationarity test; second, the Granger causality test and third the Co-integration test

3.1 Stationarity Test

Augmented Dickey Fuller unit root test was performed to check the stationarity for the given data.

The variables: FDI, FII, Remittances, Capital Account Balance and Real GDP growth rate are checked for stationarity. The null hypothesis and alternative hypothesis are defined as follows

H_0 : there is unit root-the time series is non-stationary
 H_A : there is no unit root- the time series is Stationary

Table 1: ADF Test Results for a Unit Root on the Original Series

Particulars	Test Statistics	10% Critical Value	Results
FII	-3.597	-2.599	Reject H_0
FDI	-1.208	-2.599	Do not Reject H_0
Remittances	0.231	-2.599	Do not Reject H_0
Capital Account Balance	-2.756	-2.599	Reject H_0
Real GDP Growth rate	-2.930	-2.599	Reject H_0

Thus from table 1 we see that at 10% significance level, the null hypothesis is rejected in case of FII, Capital Account Balance, Real GDP Growth rate with 90% confidence. In case of FDI and Remittances we fail to reject the null hypothesis at 10% significance level.

ADF test results for a unit root on the first difference of the original series

Particulars	Test Statistics	10% Critical Value	Results
First Difference FDI	-7.422	-2.599	Reject H ₀
First Difference Remittances	-9.936	-2.599	Reject H ₀

First difference of remittances and of FDI was taken and to make the series stationary and ADF unit root test was performed once again. The results are given in the table above.

3.2 Granger Causality Test

A VAR system of k lags was used and optimal lag length was estimated for the series given in **Table 2** below. VAR with different lags was incorporated and the results were obtained by majority rule. Thus the final VAR used in our analysis is at lag 4 for FDI, FII, remittances and Capital account balances with the real economic growth rate.

This test in the VAR framework formulates the null hypothesis and alternative hypotheses as:

H₀: No causal relation between them.
H_A: Causality between the variables.

From the Granger Causality results presented in **Table 2** we can observe the causal relationship with the direction of causation. The null hypothesis and alternative hypothesis for testing the Granger causality between two variables „x“ ad „y“ are as follows:

H₀: x does not Granger cause y
H_A: x Granger causes y

We check at 10% significance level and reject hypothesis when p-value < 0.1000, otherwise do not reject the null hypothesis.

Table 2: Results of Granger Causality Test

Null hypothesis	df	p-value of the F-test	Conclusion at the 10% level
H ₀ : Growth does not cause FII	4	0.1914	Do not reject H ₀ . That is, economic growth does not Granger cause FII
FII			
H ₀ : FII does not cause Growth	4	0.3029	Do not reject H ₀ . That is, FII does not Granger cause economic growth
H ₀ : Growth does not cause FDI	4	0.4409	Do not reject H ₀ . That is, economic growth does not Granger cause FDI
FDI			
H ₀ : FDI does not cause Growth	4	0.6772	Do not reject H ₀ . That is, FDI does not Granger cause economic growth
H ₀ : Growth does not cause Remittances	4	0.8686	Do not reject H ₀ . That is, economic growth does not Granger cause Remittances
Remittances			
H ₀ : Remittances does not cause Growth	4	0.9941	Do not reject H ₀ . That is, Remittances does not Granger cause economic growth
H ₀ : Growth does not cause Capital Account	4	0.005	Reject H₀. That is, economic growth granger causes capital account
Capital Account			
H ₀ : Capital Account does not cause Growth	4	0.3367	Do not reject H ₀ . That is, capital account does not cause economic growth

3.3 Co-integration

The notion of co-integration, which was given a formal treatment in Engle and Granger (1987), makes regressions involving I(1) variables potentially meaningful. To test causality between two variables, they were regressed on each other and the residual was generated for each regression. Residual lag and first difference of lag were generated in each case. Finally the first difference of residual of each case was regressed on the respective residual lag and the t-statistics was checked at 10% significance level. This test is known as **Engle-Granger test**. It determines the existence of a long run relationship between the variables under consideration.

The null hypothesis and alternative hypothesis for testing co-integration are as follows:

H_0 : No co-integration exists

H_A : Co-integration exists

Table.3 below presents the results of the co-integration analysis.

Table 3: Test for co-integration

Particulars	Critical Value for 10%	t value	Results
	significance level		
FII->Growth	-3.04	-3.95	Reject H_0
Growth->FII	-3.04	-3.36	Reject H_0
Conclusion	FII and Growth series are co-integrated		
FDI->Growth	-3.04	-1.31	Do not Reject H_0
Growth->FDI	-3.04	-3.00	Do not Reject H_0
Conclusion	FDI and Growth series are not co-integrated		
Remittances->Growth	-3.04	-0.03	Do not Reject H_0
Growth->Remittances	-3.04	-2.92	Do not Reject H_0
Conclusion	Remittances and Growth series are not co-integrated		
Capital A/c->Growth	-3.04	-3.51	Reject H_0
Growth->Capital A/c	-3.04	-3.68	Reject H_0
Conclusion	Capital A/c and Growth series are co-integrated		

Here we check the t-value at 10% level of significance to see if we reject or do not reject the null hypothesis.

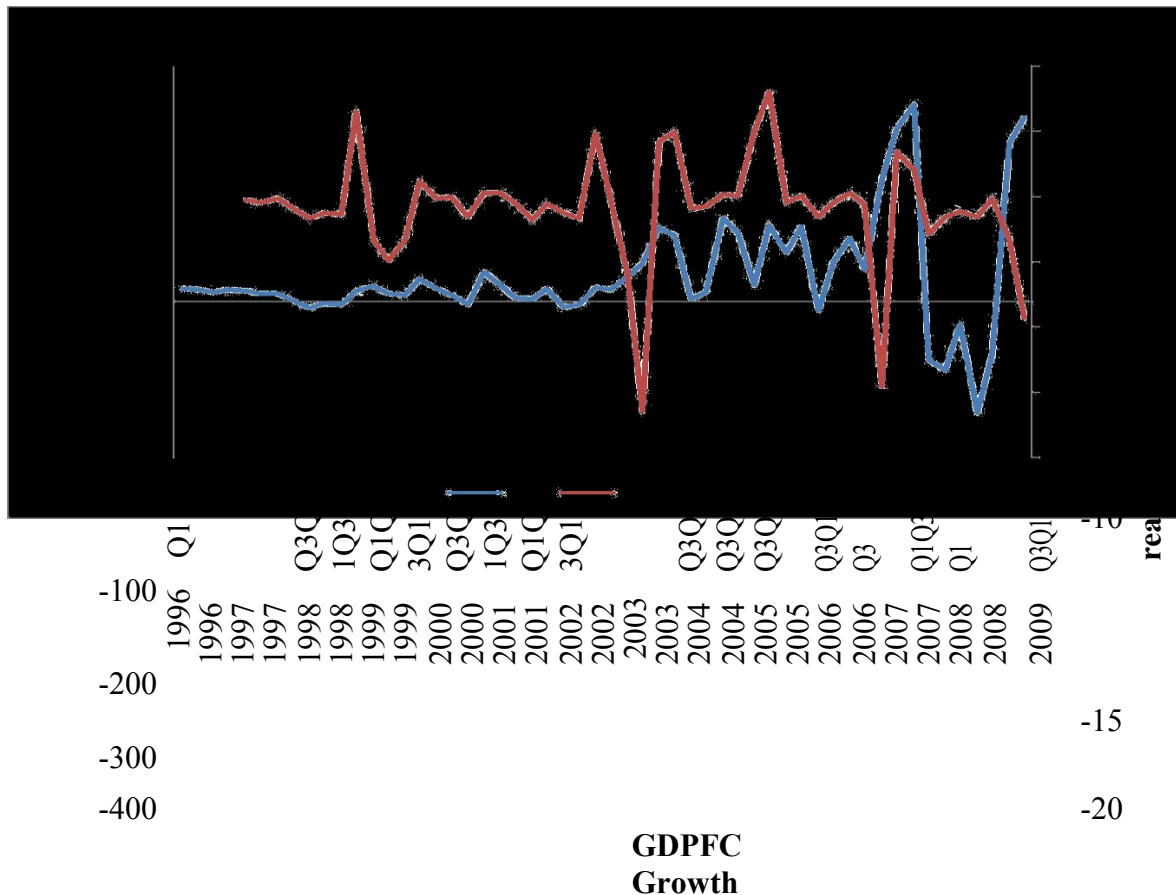
4. Conclusion

From the results obtained it can be concluded that there is no causal relationship between capital inflows in the form of FII, FDI and Remittances, and real GDP growth rate for India in the period under consideration. However there is a unidirectional causal relationship from real GDP growth rate to capital account, in other words change in real GDP growth rate causes change in capital account. Co-integration results reveal that FII and growth rate are co-integrated, capital account and growth series are co-integrated. Whereas, FDI and growth series and remittances and growth series, are not co-integrated. Following is an explanation to substantiate the results obtained.

The reason behind no causality from FII to real GDP growth rate is that, FIIs are of speculative nature and, may fluctuate rapidly. Moreover FII is the investment in the financial assets which does not increase productivity and thus it does not contribute to real GDP growth rate. Thus our result that

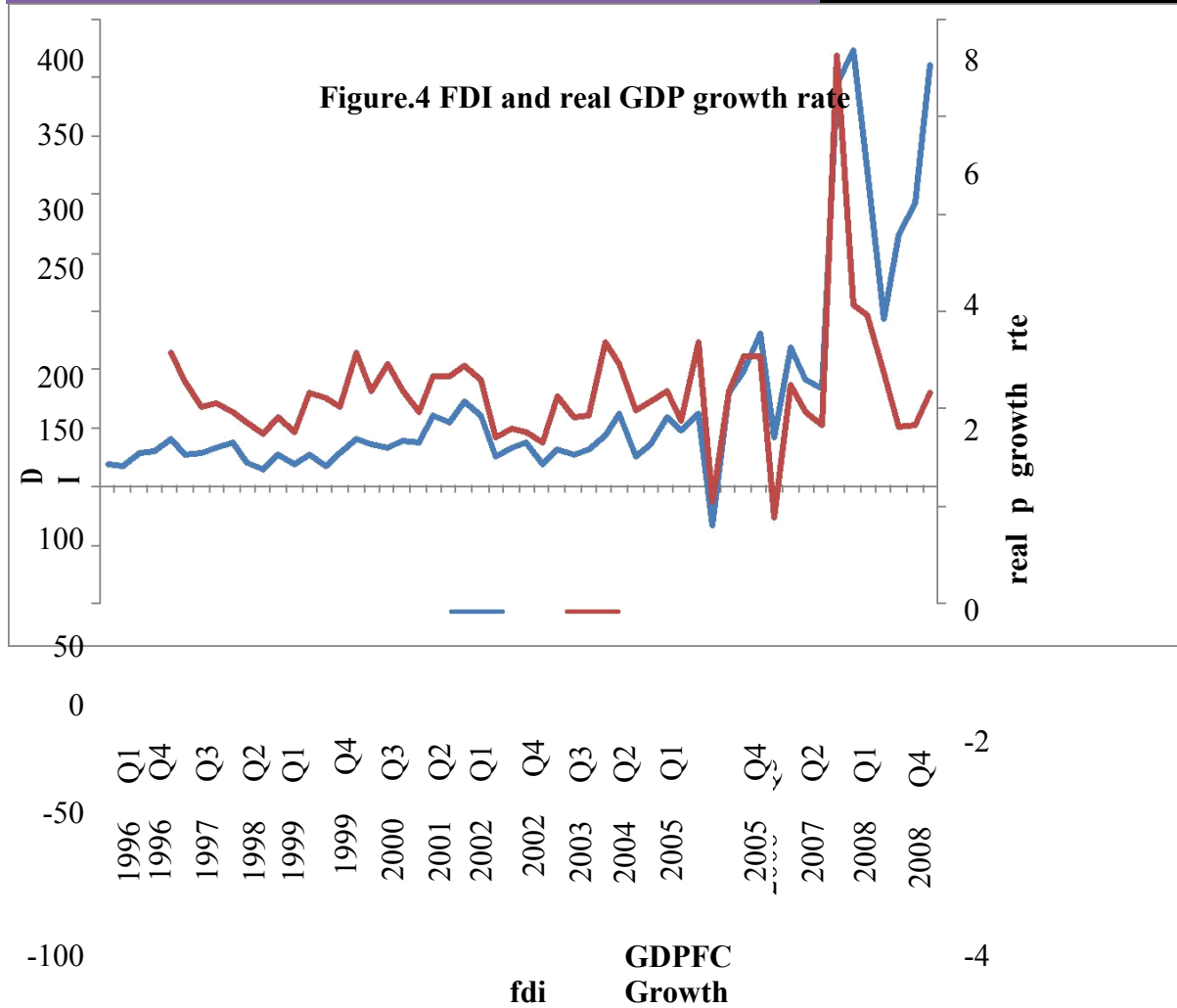
there is no causal relationship between real GDP growth rate and FII is robust. Also we can see in the **Figure.1** below that the FII is increasing in 2007 while Real GDP growth rate is not following to FII. Thus we can conclude there is no causality from FII to Real GDP growth rate.

Figure.1 FII and real GDP growth rate



The Granger causality result also shows that there is no causal relation from real GDP growth rate to FII. The rationale behind this that real GDP growth rate does not contribute to FII because the FIIs are attracted towards those market which gives higher returns. In contrast, if market is not giving the higher return FII will outflow from the market. Thus we see Real GDP growth rate does not cause to FII. But in long run, there may be relationship between FII and Real GDP growth rate. By the Engle Granger co-integration test we find that FII and Real GDP growth rate are co-integrated, this could be because of the fact that over a period of time the returns earned due to FII intervention in the stock market by investors could add to the consumption component thus impacting the economic growth.

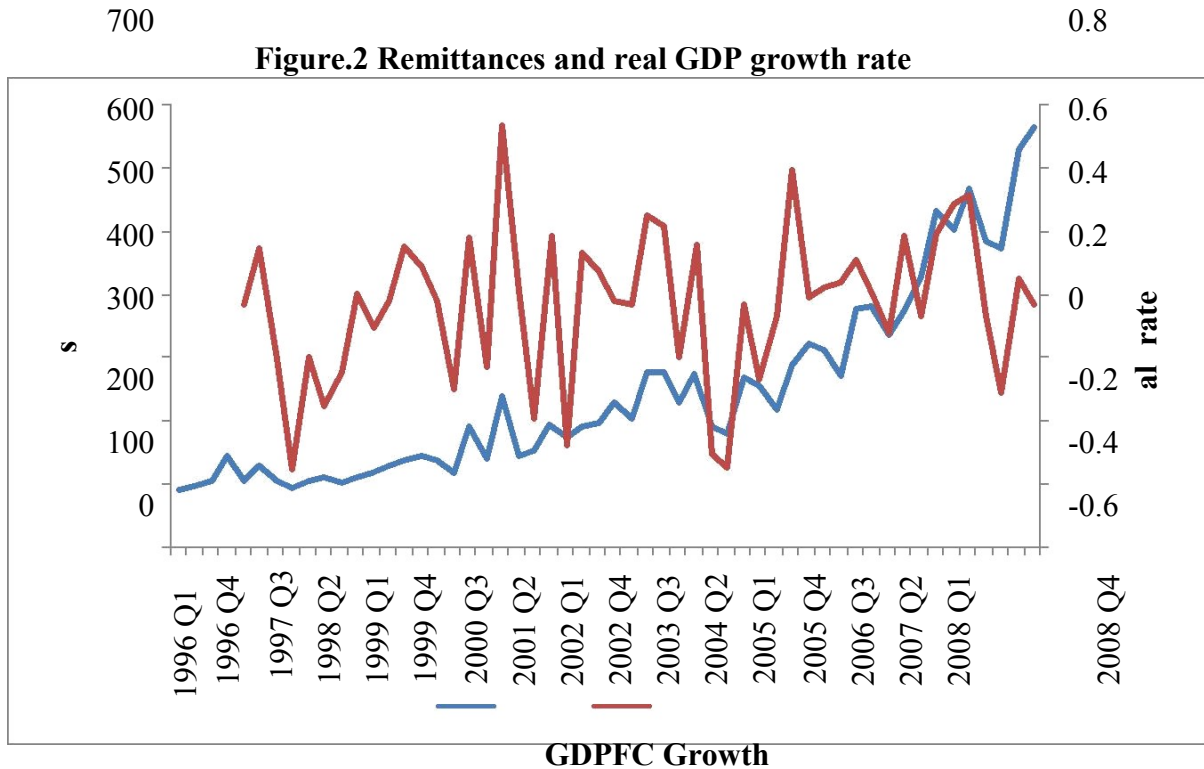
At the 10% level of significance we find that there is no causality. The rationale for the same could be that FDI during the period of study could be having a crowding out effect replacing domestic investment by foreign investment thus leading to no affect on the growth rate of a country as much. It could also be with the nature of FDI speculative or just taking up ownership controls of host country's firm thus not contributing to any productive activity thus not to any growth rate as such. GDP growth rate may also not cause any causality either because FDI inflows depend not only on the host country but also on the other alternatives available. Thus we can be growing at a rapid pace and still not attracting FDI as there could be other better opportunities available for them to be invested. The pattern in the graph shows this.



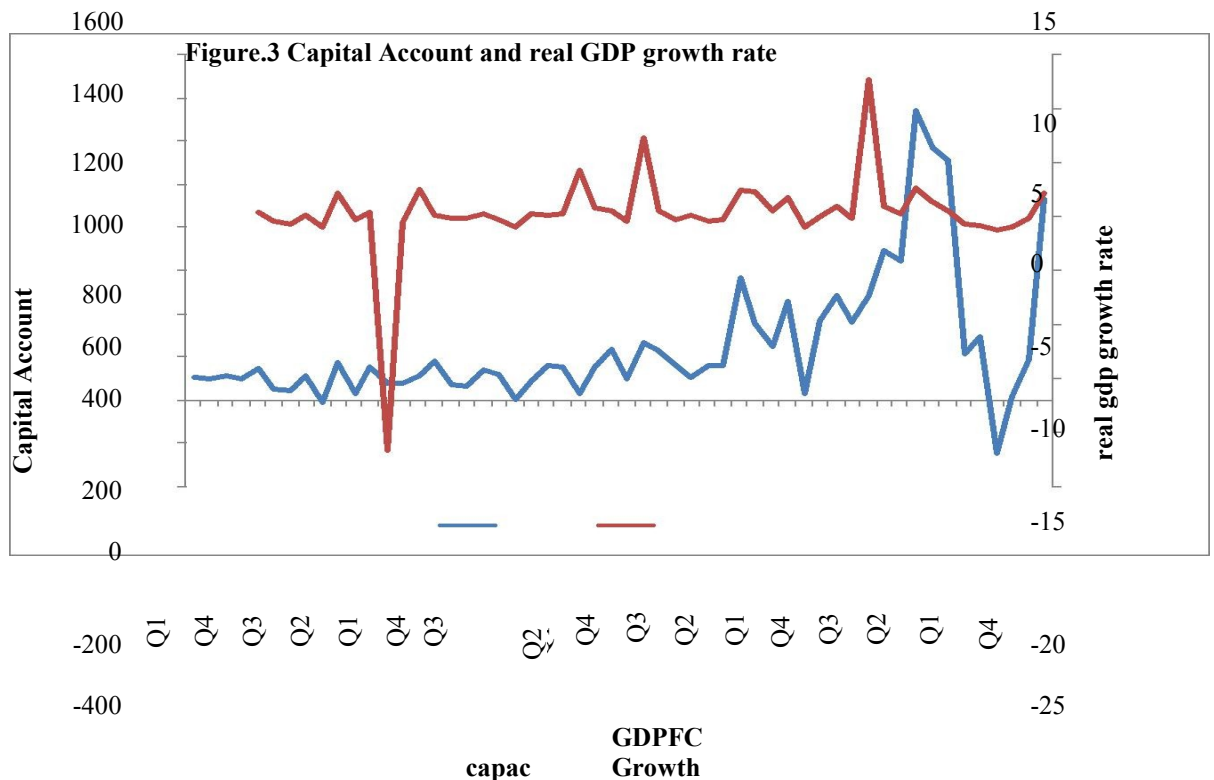
We have no co integration because FDI is a stock of money that comes in a given period of time gets added to the GDP having a multiplier effect on the growth rate but that is only for a short period of time and after each cycle the impact reduces becoming zero in the long run.

No causal relationship is found between remittances and Real GDP growth rate. There may be many reasons for this. One reason for no causality may be that as we know most of the remittances or all are either consumed or invested in unproductive activities, plus the other way causality is also not possible as remittances are transfers from abroad and have not much to do with the domestic economic environment of the parent country, therefore is also no causal relationship from Real GDP growth rate to remittances too.

As far as the long term impact go, we find no co-integration because remittances are more about individuals and world economic environment thus we cannot make any claims about long term relations.



In Granger causality test we found unidirectional causality from Real GDP growth rate to capital account. Given that we found no causality between FDI and FII which are the components of capital account it has to be the reserves or some other forms of investment or loans which are driving this causality. Given the unidirectional aspect we can comment that it's the exports which is causing large amount of foreign currency inflows which is adding as reserves thus as GDP growth rate increases the capital account is becoming favorable. There is also co-integration between them which could be due to the role played by its components in the long run.



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