Impact of foreign financial inflows on economic growth of Pakistan

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Abstract

This paper investigates the causal relationship between foreign financial inflows and economic growth for Pakistan using annual data from 1981 to 2009. The paper uses time series econometrics tools to investigate the relationship between foreign financial inflows, real exchange rate, trade openness, government expenditure and economic growth. The study found positive relation between foreign financial inflows and economic growth for Pakistan. The causal relation is unidirectional from growth to financial inflows.

JEL Classifications: C32, F24, F43
Keywords: Remittances, Foreign Direct Investment, Economic Growth and Time-Series Models

I. Introduction

1.1. Background

The contributions of foreign financial inflows portray different economic growth stories of many economies over different period of time. Pakistan, a small open economy, is dependent on the foreign financial inflows. These foreign financial inflows are basically foreign savings. Any movement in the prices of demand and/or supply of goods and services put pressure on both foreign financial inflows and economic growth of the economy concerned. This can be seen from the trade openness ratio which is around 35% in 2009 in Pakistan. The causal relationship between economic growth and foreign financial inflows help identifying direction of economic policy. So the important question is to detect long run relation between foreign financial inflows and economic growth. After observing the Relationship between foreign inflows and economic growth, it is important to note the direction of causality i.e., financial inflows causing economic growth or vice versa.

GDP growth of Pakistan has been 4.5 per cent in the past three decades with increasing foreign direct investment (FDI), remittance (REM) and foreign economic assistance (ODA). Export growth is often considered to be a principal determinant of production and

employment growth in an economy. It is also argued that foreign currency made available through export earnings facilitates import of capital goods, which in turn increases production potential of an economy. FDI, remittances and economic assistance play very important role in improving the foreign exchange reserve and current account balance of any country. Foreign financial inflows like, Remittances, foreign direct investment and official development assistance are components of balance of payment of an economy. The motivation to analyze impact of different financial inflows on economic growth lies in looking at speed of change in output level, employment, trade etc, during the period of study. The relationships between foreign direct investment, remittances, economic assistance and economic growth have been a subject of much interest in the development and growth literature. Considering trade as key player, the neoclassical view argues that there is a strong relationship between export expansion through foreign financial inflows and economic growth. The causality from export to economic growth has been labeled in the literature as the export-led growth hypothesis.

In the early 1980s, Pakistan stressed on an outward development strategy. Accordingly, reducing tariffs and quota imposed on imports. This in turn created an increase in foreign direct investment expansion within Pakistani economy. The 1990s was empirically considered as policy shift toward export-promotion from import substitution. In 2009, Pakistani workers, unskilled and semi-skilled, send huge amounts of foreign currency, which at times exceeded 43% of the exports earning from goods and services and foreign economic assistance are around 12% of the export earnings. There are few studies few have taken the impact of real exchange rate, foreign direct investment, remittance and FEA on growth into account.

The study investigates relationship of real exchange rate (RER), Forteign direct investment (FDI), remittances (Rem) and Official development assistance (ODA) on GDP growth in Pakistan. No other previous studies looked at RER with remittance and ODA. This study is conducted to investigate the relationship between GDP and different foreign inflows as sum of remittances, foreign direct investment and official development assistance. In Pakistan many structural reforms like structural adju during the eighties and early nineties. This has impact on the overall the trade pattern and economic growth. Recent studies on Pakistan by M. Hussain, S.Alam & M.S.Butt (2004), Bushra Yasmeen (2005), N.S.Shirazi & T.A.A.Manap (2005), M.A.Khan & A.Ahmed (2007), A.Qayyum et al (2008) and N.Falki (2009) empirically analysed different foreign inflows with economic growth.

1.2. Research problem

Foreign direct investment, remittances and economic assistance play very important role in improving the foreign exchange reserve and current account balance of any country. These Foreign financial inflows play very important role in the economic development of the developing as well as developed economies. The effectiveness of foreign inflows depends on the direction of policy and transmission mechanism to economic growth of

an economy. Pakistan is open economy and receiving reasonable volume of these inflows. There is a need to observe the ability to measure impact of foreign financial inflows on the economic activity of Pakistan.

1.3. Objective of Study

The objectives of the study are:

- To estimate the impact of foreign financial inflows on economic growth in Pakistan
- To analyze the short run and long run dynamics of foreign inflows
- To identify the direction of causation between foreign inflows and economic growth

1.4. Scope of the study

This study may help in policy making and decision making process for economic growth of Pakistan. It may also help identifying the linkages and channels for economic growth. An empirical investigation is the focus of this study while some theoretical issues will also be discussed in the literature review.

1.5. Limitation of the study

It is important to mention that the study will be restricted to aggregated data of foreign financial inflows because the objective is to estimate the relation between foreign inflows and economic growth. The study need not to identify the relative importance of the components of foreign inflows and their separate role in the economic development of Pakistan. However, role of real exchange rate will be discussed to elaborate the results.

1.6. Organization of study

The study is organized in six sections. Section 2 discusses the literature. Some stylized fact is discussed in section 3 and data and methodology are discussed in Section 4. Finally, Section 5 discusses the results and Section 6 provides some concluding remarks.

2. Literature Review

The pace of economic growth is important for economists and policy makers. The rate of economic growth depends on the internal and external factors of an economy. The external factors like foreign financial inflows, imports etc contribute dominating role in the economic development of developing countries in general and particularly in Pakistan. It is said that remittances and foreign economic assistances may be used in financing the imports which ultimately accelerate the economic growth. Once there is increase in foreign economic assistance and remittances, it leads to appreciate the real exchange rate of the country. This necessitates including real exchange rate in the model to estimate the impact of foreign inflows in economic growth.

A large number of studies tested foreign financial inflows and economic Growth hypothesis using different econometric procedures ranging from simple OLS to multivariate co integration but previous empirical studies have produced mixed results on the nature and direction of the causal relationship between foreign inflows growth and output growth. Most of the previous studies looked at FDI but not with remittance and of ODA and RER as a variable. There is no consensus on the role of foreign inflows. On one hand, economists agreed on the relationship between foreign inflows and economic growth. On the other, many economists highlighted the problem of smooth transmission mechanism of different inflows in various countries.

Study by Prasad et al (2007) explored the relationship between foreign capital inflows and economic growth and try to answer the question "does foreign capital play helpful, benign or malign role in the process of economic growth"? The author took corporate governance, dependence of industry on finance, domestic credit to GDP, openness to capital inflows as independent variable and growth as dependent variable. All variable are average for the period 1970-2004. Study found negative role of foreign capital inflows on developing countries.
Study by Mohsin et al [2004] examine manufacturing production as domestic production , exports, FDI and real exchange rate using Johansson technique over a period of 1972-2001. Findings suggest Pakistan's economic development will depend on her performance in attracting foreign capital. Pakistan's outward looking policy should include FDI as an essential part in addition to export promotion strategy.

Study by Shahzad Iqbal [2010] investigates causality between Fdi, trade and economic growth in Pakistan. Using quarterly time series data from 1998-2009. In VAR model, the integration and co integration analysis suggest that there is long run relationship among factors. The author stressed on government to play positive role in proving security to investors around the globe.

Study by Sami Ullah [2009] reinvestigated the export-led growth nexus using Unit root, co integration and Granger causality through VECM over the period 1970-2008 for Pakistan. He found unidirectional causality between economic growth, exports and imports.

A study by Bushra Yasmeen [2005] analyses the dynamic relationship between foreign capital inflows and economic growth using foreign capital inflows as sum of loans and grants, FDI and portfolio investment and trade liberalization as dummy in simultaneous equation model over a period of 1972-2001. It showed that FDI has positive impact on economic growth whereas portfolio investment and loans have no significant role in the economic growth of Pakistan.

Another study by Shirazi and Turkhan [2005] uses export, import and real GDP as variables over a period of 1960-2003. Using Toda & Yamamoto technique, the study found significant role of trade on economic growth in Pakiastan.

Study by Arshad and Ahmed [2007] explored the linkages of foreign aid in economic development of Pakistan. Author applied ARDL technique for a period 1972-2006 and took exports, FDI and labor force as independent variable and economic growth as dependent variable. The results exert insignificant role of foreign aid on real GDP whereas real exports, FDI and labor force have positive and significant role on real GDP.

A study by Qayyum et al[2008] explicitly focus on the role of remittances on the economic growth. The variables used were remittances, investment, human development index and trade openness. Using ARDL technique over a period of 1973-2007, the study found significant role of remittances in the economic growth of Pakistan.

Falki[2009] examined the impact of FDI on economic growth of Pakistan. The variables used were FDI, GDP, labor, capital and trade using production function technique for period 1980-2006. The interesting finding relating to negative relation between FDI and economic growth were shown.

Mah[2010] the study examined relationship between FDI and economic growth for Korea and tested Bhagwati hypothesis using time series data from 1970 to 2006. Author used trade openness, FDI inflow and gross domestic investment as independent variable. Granger causality shows no relation between FDI and economic growth.

This study attempted to explain the economic growth in terms of aggregated foreign financial inflows as a sum of remittances, foreign direct investment and the official development assistance, trade openness, real exchange rate and government expenditure. No other study took foreign inflows as such. Most of the studies took FDI as a determining factor whereas in case of Pakistan remittances and official development assistance played very important role in the economic development process during the period of analysis.

3. Theoretical Model

Foreign capital inflows-led growth hypothesis provide an opportunity in choosing variables for this study on the determinants of Pakistani economic growth. Basically, our

model is formulated on the studies conducted by Koeng et al (2002) which explains economic growth as a function of exports, labor, imports, capital formation and exchange rate. This model further took trade openness and terms of trade as control variables. The expected signs for exports, labor force and exchange rate are positive. The identified model is a five variable model, which hypothesizes that economic growth (Real GDP) is a function of aggregated foreign inflows (FFI), trade openness (Trop), real exchange rate (RER) and government expenditure (GE). The expected signs for FFI, RER, and Trop would be positive.

4. Some stylized facts

The key economic indicators of Pakistan economy shows an increase in the GDP, GDP per capita and trade volume in the last three decades. The average annual GDP growth is about 5.1% during 1981-2009. Pakistan economy is divided into tradable (agriculture, industry) and non-tradable (services) sectors. Economic growth of developing countries like Pakistan depends on the expansion of tradable sector. The volume of different foreign financial inflows was relatively low in 1980s. The average yearly receipts were $5887.078 million during the period of analysis. The real exchange rates have also been appreciated in the years of concern. The annual average rate of different foreign financial inflows remained at 7.7 as percent of GDP whereas growth rate of GDP was 5.1% during the period of analysis. It is important to note that we used aggregate foreign inflows by summing three main categories (FDI, REM, and ODA). Before describing the econometric model, we briefly review historical trend of foreign inflows and real exchange rate and output-employment trend in Pakistan.

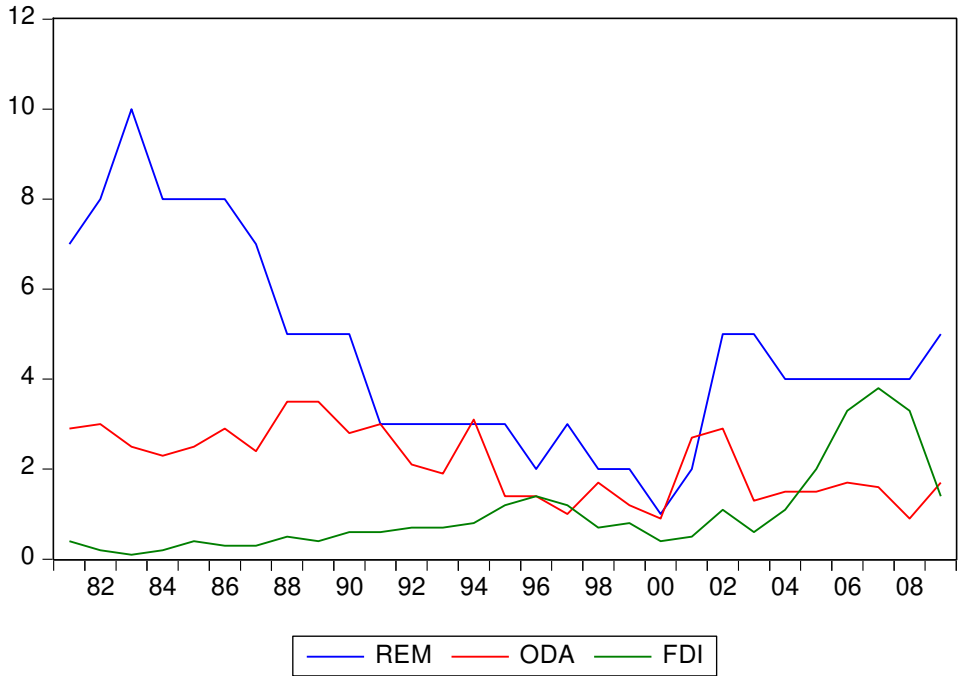
A) Historical Trend of Foreign Financial Inflows

The three components of foreign financial inflows are discussed here. Firstly foreign direct investment (FDI) has been the most important part of foreign capital[2], a very small amount, i.e., $29035 million during last 27 years. FDI had never been more than 1% of real GDP during the period of analysis in Pakistan. Secondly remittances have been the most important part of FFI. In early 1950s foreign inflows were mainly in the form of foreign official loans and grants; the major providers of official funding included bilateral and multilateral countries. World Bank has been one of the major sources of funding. During 1981-2009, Pakistan in total has received around $170725 million from different

[2] For details Agenor (1998).

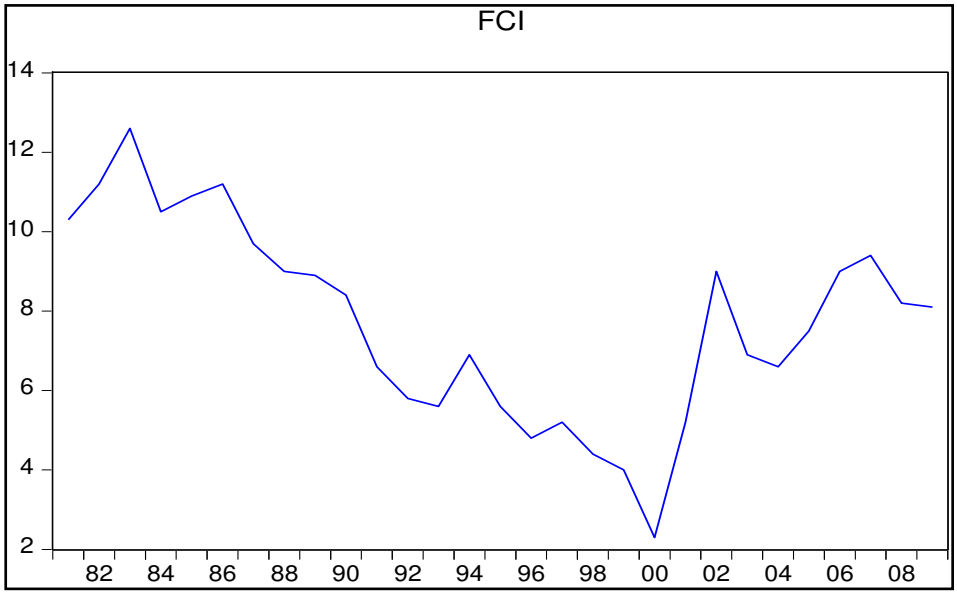
sources including remittances, foreign direct investment and official development assistance & grants (World Development Indicators 2010).

Fig No: 1a



Source: WDI 2010

Fig 1b



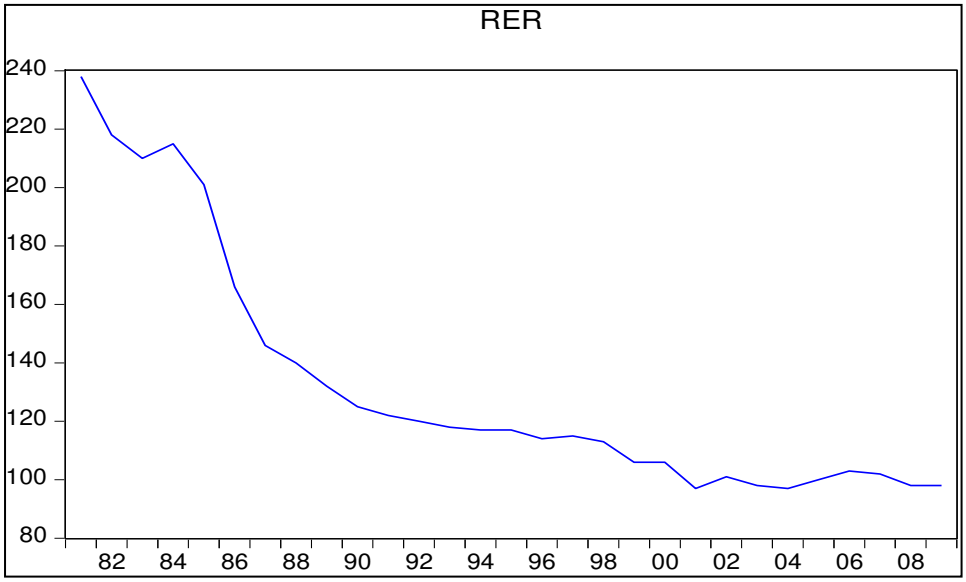
Source: author calculations

From 1981 to 2009, Pakistan received on average yearly $5887 million foreign financial inflows in different forms; figure displays foreign inflow receipts as a percent of GDP. While during the same period real GDP grew at an average annual rate of 5.1% (GDP per capita was only at US$494 on average).

B) Historical Trend of Real Exchange Rate

Real exchange rate is determined by internal and external factors. Import tariff, taxes, subsidies, technological progress, terms of trade, foreign financial inflows and real exchange rate are important factors. The appreciation in real exchange rate means increase in domestic cost of producing goods which causes competitiveness problem. The real exchange rate data series is taken from world development indicator (WDI)

Fig No: 2



Source: WDI (2010)

Keeping the base year value (2000=100), on average real exchange rate indexes declined from 1981 to 2009 (i.e., appreciated), and generally followed a downward trend. Continuous appreciation in the real exchange rate can be seen during the period of analysis.

c) Historical Trend of in GDP Growth variables

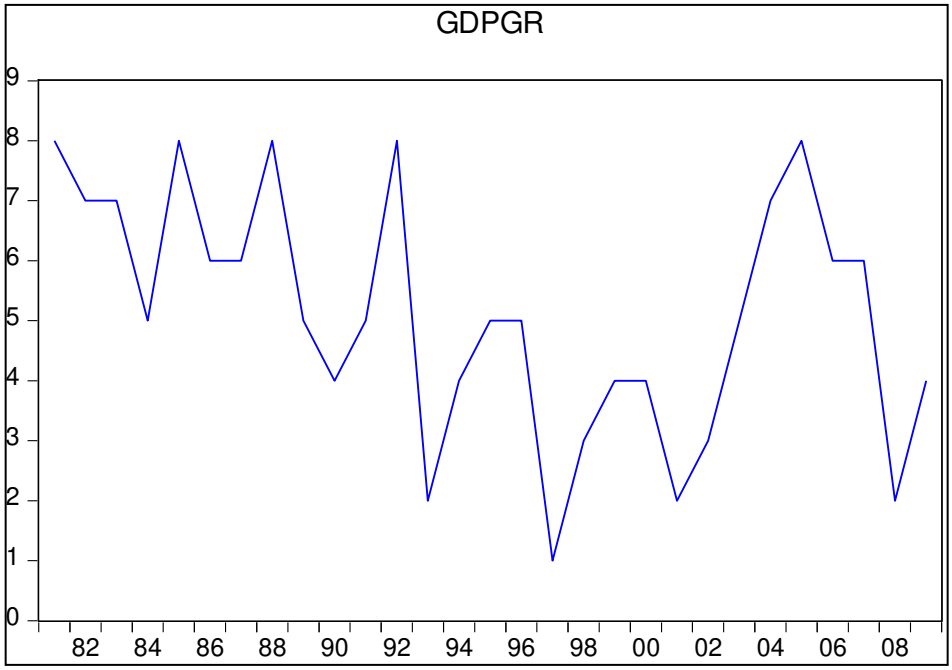
Pattern of GDP growth in Pakistan is important to analyze. The last three decades average growth remained at 5.1%. Pakistan's economy has been suffering from internal political disputes, a fast growing population, and appreciation in real exchange rate. However, government policies, supported by foreign investment and access to global markets, have generated macroeconomic recovery during the period of analysis. Average annual growth in 1980s is highest whereas 1990s shows relatively slower growth. But dependence on openness is increasing during the last three decades consecutively. On the other hand, Foreign financial inflows first decreased then showed increasing trend in the last decade.

Table: 1

Column1	Column2	Column3	Column4
Decades	GDPGR	Trade openness	Foreign Financial inflows
1980s	6.1	23.7	10.27
1990s	4.4	25.5	5.12
2000s	4.8	29.4	7.8

Source: SBP and WDI

Fig No: 3



Source: SBP annual Report

5. Data and Methodology

Annual data on Real GDP, foreign direct investment, remittance and foreign economic assistance from 1981 to 2009 are used for this paper. Real GDP, FDI, remittances and foreign economic assistance (base year 1999-2000) data are collected from World development Indicator 2010 (World Bank). Data on FDI, foreign economic assistance and remittance are converted into real terms using GDP deflator. All the data used in the study are in percentage form. The study use Y, FDI, and ODA and Rem for real GDP, real FDI, real foreign economic assistance and real remittance respectively. In this study VAR model is used by introducing five variables. We test for unit root, Co integration and then ECM for Granger Causality.

The first step is to check for the statiority of variables. An augmented Dickey–Fuller (ADF) test is applied. If the calculated ADF statistic is less than its critical value, then X (real GDP, FDI and remittance, ODA) is said to be stationary or integrated of order zero, i.e. I (0). The Phillips Peron (PP) unit root test is also applied in addition to the ADF test, to check the stationary property of the data set used in the study.

The next question is to investigate whether all the variables in the model should enter into a long-run equilibrium relationship. The number of co integrating relationships found. Thirdly Error correction model is estimated to observe the short run relationship between variables.

6. Estimation and Analysis

Descriptive statistics and correlation

Before starting the econometric analysis, Descriptive statistics in table 1 exhibit Jarque Bera which is normal. This means all the series observed are normal. Standard deviation is higher for all the series showing more volatility in the variables. Correlation matrix is drawn in table 2 to observe the correlation among different variables. Correlation between GDP and FCI is 0.51 which is the highest and low correlation is observed between GE, trop and GDP. Probability of Jarque Bera shows that distributions are normal. As standard deviation exhibit deviation from average values, trade openness shows less deviation as compared to GDP and RER.

Table 1: Descriptive statistics

Variables	LGDP	LFCI	LRER	LGE	LTROP
Mean	10.97	1.98	4.84	2.41	3.54
Median	11.01	2.09	4.76	2.48	3.56
Maximum	12.01	2.53	5.47	2.83	3.66
Minimum	10.24	0.83	4.57	2.08	3.33
Std. Dev.	0.53	0.38	0.28	0.21	0.08
Skewness	0.44	-0.98	1.08	-0.02	-0.64
Kurtosis	2.21	4.04	2.83	2.13	2.99
Jarque-Bera	1.68	5.97	5.67	0.92	1.96
Probability	0.43	0.051	0.059	0.63	0.37
Observations	29	29	29	29	29

Table 2: correlation matrix

Variables	LGDP	LFCI	LRER	LGE	LTROP
LGDP	1.00				
LFCI	0.31	1.00			
LRER	0.83	0.57	1.00		
LGE	0.55	0.19	0.32	1.00	
LTROP	-0.07	0.25	-0.06	0.63	1.00

We test the stationarity properties of the variables under consideration i.e. their order of integration, then test for co integration among the variables. Finally, we test for Granger Causality among the variables in VECM framework. RER showed Multicollinearity issu with GDP whereas FCI and GE show strong relationship with GDP.

Testing for Stationarity

In order to investigate the stationarity properties of the variables under consideration (real GDP, FDI, ODA, Rem, and sum as FCI, GE, Trop, and RER) we carry out a univariate analysis for testing the presence of a unit root. Table 1 below reports the Augmented Dickey-Fuller (ADF) *t*-tests and Table 2 report the Philips Perron Test statistics for the variables.

Table 3: Unit Root Test

Column1	PP		ADF	
Variables	level	Ist Diff	level	Ist Diff
LGDP	0.80	0.00	0.80	0.00
LFCI	0.74	0.00	0.69	0.00
LRER	0.86	0.01	0.84	0.01
LGE	0.32	0.00	0.28	0.00
LTrop	0.31	0.00	0.31	0.00

The results indicate that at level all the variables are non stationary in both ADF and PP tests (values given in table are probabilities). The variables become stationary at their first difference in both ADF and PP tests at 5% level of significance. Optimal lag lengths

are selected using the Akaike criterion (AIC). Since, differencing once produces stationarities, we conclude that the variables under consideration are integrated of order 1i.e. *I* (1)*.*

Testing for Cointegration

Since the variables are integrated of order 1, i.e. ***I(***1***),*** we can test whether they are co integrated or not (Engel and Granger, 1987). We test for the number of co integrating relationships using the approach proposed by Johansen (1988) and Johansen and Juselius (1990). The optimal lag length of the level VAR system is determined using the Akaike's Information Criterion (AIC), Hernan- Quinn criterion (HQ) and Schwartz criterion (SC). Table 4 below reports the number of co integrating relationships among the variables under consideration.

Table 4: Johansen Co integration Test

Hypothesized		**Trace**	**0.05**		**Max-Eigen**	**0.05**	
No. of CE(s)	**Eigenvalue**	**Statistic**	**Critical Value**	**Prob.****	**Statistic**	**Critical Value**	**Prob**
None *	0.72	78.22	69.82	0.01	34.69	33.87	0.04
At most 1	0.52	43.54	47.86	0.12	19.65	27.58	0.4
At most 2	0.40	23.88	29.80	0.20	13.86	21.13	0.4
At most 3	0.27	10.02	15.49	0.27	8.61	14.26	0.31
At most 4	0.051	1.41	3.84	0.23	1.41	3.84	0.23

Results of both Trace and Maximum Eigen value tests suggest the existence of at least one co integrating relationships among the variables in the series at 5% level of significance. This implies that the series under consideration are driven by one common trend. We save the residuals from the first equation of the VAR, which are used as the error-correction term in the subsequent tests for Granger causality. The normalized co integrating equation is

LGDP = 1.19LFCI+0.29LTrop-1.10LGE-3.20Lrer
T-values (6.3) (0.32) (-3.2) (-11.4)

It is important to note that the long run, there is positive and significant relationship between LFCI and LGDP. The size of coefficient shows one unit increase in FCI cause 1.19

times increase in economic growth. This signifies more productive impact of FCI on GDP. Negative sign of GE may exhibit unproductive impact on economic growth. Similarly negative sign of RER i.e., appreciation of RER impact LGDP negatively. The impact of depreciation in the exchange rate on LGDP could be positive or negative depending upon the elasticity's of imports and/or exports (Marshall Lerner condition). Trop has insignificant impact on the LGDP though it is positive.

After checking the long run relationship between variables, we now move to test for the short run dynamics i.e., Vector Error Correction Mechanism (VECM). The results shown in the appendix show that only FCI has significant impact on GDP. Error correction term is significant and expected sign which confirms the co integration relationship. This shows that 17% of deviation from long run equilibrium is adjusted in each period. Moreover, pair-wise granger causality shows unidirectional causal relationship between growth and foreign financial inflows. This result is consistent with Arshad (2007) and Yasmeen (2005).

Comparing results with previous studies, it is important to note that no study has taken FDI, remittances and Oda as the foreign financial inflows. But to some extent sign of FDI, Oda can be matched.

7. Conclusion

The study found positive impact of foreign financial inflows on economic growth. Time series analysis indicates FCI cause GDP growth in the long run but not in the short run. Furthermore, the causal nexus is unidirectional. The results also highlight the optimum policy on development projects and identify that real exchange rate appreciation must be checked.

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Appendix

VAR Lag Order Selection Criteria
Endogenous variables: GDP FCI GE TROP RER
Exogenous variables: C
Date: 11/04/11 Time: 15:39
Sample: 1981 2009
Included observations: 27

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-359.6771	NA	370980.4	27.01312	27.25309	27.08448
1	-274.0069	133.2649*	4304.189*	22.51903*	23.95884*	22.94716*
2	-249.8889	28.58423	5686.735	22.58436	25.22403	23.36928

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Vector Error Correction Estimates
Date: 11/17/11 Time: 12:15
Sample (adjusted): 1983 2009
Included observations: 27 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
LGDP(-1)	1.000000
LFCI(-1)	-1.194220 (0.19473) [-6.13276]
LRER(-1)	3.200899 (0.28127) [11.3802]
LTROP(-1)	-0.294168 (0.88684)

	[-0.33170]
LGE(-1)	1.104350
	(0.35061)
	[3.14981]
C	-25.70968

Error Correction:	D(LGDP)	D(LFCI)	D(LRER)	D(LTROP)	D(LGE)
CointEq1	-0.171006	0.421860	-0.032122	0.018273	0.064403
	(0.03151)	(0.15314)	(0.03116)	(0.04673)	(0.08762)
	[-5.42667]	[2.75482]	[-1.03083]	[0.39100]	[0.73505]
D(LGDP(-1))	-0.332153	2.838185	0.054350	0.626580	0.662960
	(0.18844)	(0.91576)	(0.18634)	(0.27947)	(0.52395)
	[-1.76261]	[3.09928]	[0.29166]	[2.24205]	[1.26531]
D(LFCI(-1))	-0.155677	0.661084	0.022368	0.158800	0.271845
	(0.05574)	(0.27089)	(0.05512)	(0.08267)	(0.15499)
	[-2.79268]	[2.44038]	[0.40577]	[1.92088]	[1.75392]
D(LRER(-1))	0.222586	-0.416184	0.304660	-0.125706	-0.507996
	(0.19417)	(0.94358)	(0.19201)	(0.28796)	(0.53987)
	[1.14635]	[-0.44107]	[1.58673]	[-0.43654]	[-0.94096]
D(LTROP(-1))	-0.102261	0.846111	0.132673	-0.195339	0.658935
	(0.16393)	(0.79663)	(0.16210)	(0.24311)	(0.45579)
	[-0.62381]	[1.06211]	[0.81844]	[-0.80349]	[1.44569]
D(LGE(-1))	0.038092	-0.767547	-0.055644	-0.156237	-0.735665
	(0.09343)	(0.45400)	(0.09238)	(0.13855)	(0.25976)
	[0.40773]	[-1.69062]	[-0.60231]	[-1.12765]	[-2.83210]
C	0.089218	-0.202021	-0.022858	-0.041116	-0.062351
	(0.01769)	(0.08598)	(0.01750)	(0.02624)	(0.04919)
	[5.04253]	[-2.34961]	[-1.30648]	[-1.56697]	[-1.26744]
R-squared	0.639300	0.383388	0.318434	0.308814	0.370195
Adj. R-squared	0.531090	0.198405	0.113964	0.101458	0.181254
Sum sq. resids	0.044936	1.061173	0.043940	0.098830	0.347383
S.E. equation	0.047400	0.230345	0.046872	0.070296	0.131792
F-statistic	5.907962	2.072553	1.557365	1.489294	1.959313
Log likelihood	48.06645	5.380892	48.36899	37.42623	20.45637
Akaike AIC	-3.041959	0.119934	-3.064370	-2.253795	-0.996768
Schwarz SC	-2.706001	0.455892	-2.728412	-1.917837	-0.660811
Mean dependent	0.061571	-0.012002	-0.029612	0.001140	-0.008265
S.D. dependent	0.069221	0.257277	0.049795	0.074158	0.145651

Determinant resid covariance (dof adj.)	7.98E-12
Determinant resid covariance	1.78E-12
Log likelihood	173.6877

Akaike information criterion	-9.902796
Schwarz criterion	-7.983038

VAR Residual Normality Tests
Orthogonalization: Cholesky (Lutkepohl)
Null Hypothesis: residuals are multivariate normal
Date: 11/04/11 Time: 15:40
Sample: 1981 2009
Included observations: 28

Component	Skewness	Chi-sq	df	Prob.
1	0.079528	0.029515	1	0.8636
2	0.047438	0.010502	1	0.9184
3	-0.223704	0.233537	1	0.6289
4	-0.231262	0.249584	1	0.6174
5	-0.378752	0.669446	1	0.4132
Joint		1.192584	5	0.9456

Component	Kurtosis	Chi-sq	df	Prob.
1	2.536301	0.250853	1	0.6165
2	3.304715	0.108327	1	0.7421
3	2.851202	0.025831	1	0.8723
4	2.285927	0.594883	1	0.4405
5	6.817295	17.00037	1	0.0000
Joint		17.98026	5	0.0030

Component	Jarque-Bera	df	Prob.
1	0.280368	2	0.8692
2	0.118828	2	0.9423
3	0.259368	2	0.8784
4	0.844467	2	0.6556
5	17.66981	2	0.0001
Joint	19.17285	10	0.0381

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 11/04/11 Time: 15:41
Sample: 1981 2009
Included observations: 28

Dependent variable: GDPGR

Excluded	Chi-sq	df	Prob.
FCI	3.211963	1	0.0731
GE	0.064783	1	0.7991
TROP	1.441709	1	0.2299
RER	0.021759	1	0.8827
All	6.897387	4	0.1414

Dependent variable: FCI

Excluded	Chi-sq	df	Prob.
GDPGR	0.326100	1	0.5680
GE	1.166932	1	0.2800
TROP	0.399877	1	0.5272
RER	1.595294	1	0.2066
All	6.610836	4	0.1579

Dependent variable: GE

Excluded	Chi-sq	df	Prob.
GDPGR	5.262013	1	0.0218
FCI	0.616682	1	0.4323
TROP	0.195671	1	0.6582
RER	0.096498	1	0.7561
All	10.62430	4	0.0311

Dependent variable: TROP

Excluded	Chi-sq	df	Prob.
GDPGR	9.876384	1	0.0017
FCI	0.464828	1	0.4954
GE	2.564464	1	0.1093
RER	4.240232	1	0.0395
All	14.47164	4	0.0059

Dependent variable: RER

Excluded	Chi-sq	df	Prob.
GDPGR	0.195422	1	0.6584
FCI	0.022654	1	0.8804
GE	1.729789	1	0.1884

TROP	1.599153	1	0.2060
All	2.286132	4	0.6833

VAR Residual Serial Correlation LM Tests
Null Hypothesis: no serial correlation at lag order h
Date: 11/04/11 Time: 15:41
Sample: 1981 2009
Included observations: 28

Lags	LM-Stat	Prob
1	20.99926	0.6927
2	32.69684	0.1388
3	23.64454	0.5400
4	20.54155	0.7179
5	24.26071	0.5044
6	27.81084	0.3166
7	15.03756	0.9405
8	27.20634	0.3457
9	18.76951	0.8080
10	18.79824	0.8067
11	14.23852	0.9574
12	15.85103	0.9192

Probs from chi-square with 25 df.

Vector Error Correction Estimates
Date: 11/04/11 Time: 15:43
Sample (adjusted): 1983 2009
Included observations: 27 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
GDPGR(-1)	1.000000
FCI(-1)	-0.511818 (0.13346) [-3.83504]
GE(-1)	0.062322

	(0.11991)				
	[0.51972]				
TROP(-1)	-0.212421				
	(0.11031)				
	[-1.92575]				
RER(-1)	0.000574				
	(0.00790)				
	[0.07276]				
C	5.423630				
Error Correction:	D(GDPGR)	D(FCI)	D(GE)	D(TROP)	D(RER)
CointEq1	-0.845368	0.732233	0.270835	0.948268	0.289226
	(0.30474)	(0.18334)	(0.20934)	(0.30706)	(1.20214)
	[-2.77407]	[3.99392]	[1.29375]	[3.08821]	[0.24059]
D(GDPGR(-1))	0.095264	-0.585720	0.082847	-0.100190	-0.738913
	(0.25802)	(0.15523)	(0.17725)	(0.25998)	(1.01783)
	[0.36921]	[-3.77328]	[0.46741]	[-0.38537]	[-0.72597]
D(FCI(-1))	-0.225405	0.193053	0.328184	0.718876	0.649141
	(0.28675)	(0.17252)	(0.19699)	(0.28894)	(1.13118)
	[-0.78606]	[1.11904]	[1.66603]	[2.48800]	[0.57386]
D(GE(-1))	0.143842	-0.048129	-0.329432	0.119646	-1.172500
	(0.32892)	(0.19788)	(0.22595)	(0.33143)	(1.29752)
	[0.43732]	[-0.24322]	[-1.45797]	[0.36100]	[-0.90364]
D(TROP(-1))	-0.281341	-0.069898	0.103698	-0.282922	0.784463
	(0.17791)	(0.10703)	(0.12222)	(0.17927)	(0.70182)
	[-1.58137]	[-0.65304]	[0.84848]	[-1.57823]	[1.11776]
D(RER(-1))	0.004649	0.028693	-0.047777	-0.003569	0.434197
	(0.04500)	(0.02707)	(0.03091)	(0.04535)	(0.17753)
	[0.10331]	[1.05980]	[-1.54545]	[-0.07870]	[2.44581]
C	-0.073181	-0.072436	-0.261149	0.064274	-2.278025
	(0.44470)	(0.26754)	(0.30549)	(0.44809)	(1.75424)
	[-0.16456]	[-0.27075]	[-0.85487]	[0.14344]	[-1.29858]
R-squared	0.450791	0.473149	0.410576	0.524519	0.312501
Adj. R-squared	0.286028	0.315094	0.233749	0.381874	0.106252
Sum sq. resids	77.25543	27.96213	36.45694	78.43679	1202.206
S.E. equation	1.965393	1.182415	1.350129	1.980363	7.753083
F-statistic	2.735999	2.993566	2.321909	3.677109	1.515162
Log likelihood	-52.50362	-38.78403	-42.36532	-52.70850	-89.55837
Akaike AIC	4.407676	3.391410	3.656691	4.422852	7.152472
Schwarz SC	4.743634	3.727367	3.992648	4.758809	7.488430
Mean dependent	-0.111111	-0.114815	-0.074074	0.037037	-4.444444

S.D. dependent	2.325996	1.428744	1.542374	2.518875	8.201001

Determinant resid covariance (dof adj.)	1728.655
Determinant resid covariance	385.5134
Log likelihood	-271.9435
Akaike information criterion	23.10692
Schwarz criterion	25.02668

Dependent variable: D(LGDP)

Excluded	Chi-sq	df	Prob.
D(LFCI)	7.799064	1	0.0052
D(LRER)	1.314119	1	0.2517
D(LGE)	0.166240	1	0.6835
D(LTROP)	0.389139	1	0.5328
All	9.062055	4	0.0596

Dependent variable: D(LFCI)

Excluded	Chi-sq	df	Prob.
D(LGDP)	9.605550	1	0.0019
D(LRER)	0.194544	1	0.6592
D(LGE)	2.858181	1	0.0909
D(LTROP)	1.128086	1	0.2882
All	10.30521	4	0.0356

Dependent variable: D(LRER)

Excluded	Chi-sq	df	Prob.
D(LGDP)	0.085068	1	0.7705
D(LFCI)	0.164652	1	0.6849
D(LGE)	0.362776	1	0.5470
D(LTROP)	0.669852	1	0.4131
All	0.848949	4	0.9318

Dependent variable: D(LGE)

Excluded	Chi-sq	df	Prob.

D(LGDP)	1.601009	1	0.2058
D(LFCI)	3.076244	1	0.0794
D(LRER)	0.885413	1	0.3467
D(LTROP)	2.090025	1	0.1483
All	5.504852	4	0.2393

Dependent variable: D(LTROP)

Excluded	Chi-sq	df	Prob.
D(LGDP)	5.026792	1	0.0250
D(LFCI)	3.689762	1	0.0547
D(LRER)	0.190571	1	0.6624
D(LGE)	1.271583	1	0.2595
All	5.694255	4	0.2232

Pairwise Granger Causality Tests
Date: 12/01/11 Time: 17:16
Sample: 1981 2009
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
LFCI does not Granger Cause LGDP	27	0.93808	0.4065
LGDP does not Granger Cause LFCI		3.30148	0.0557
LTROP does not Granger Cause LGDP	27	0.23179	0.7950
LGDP does not Granger Cause LTROP		1.90553	0.1725
LRER does not Granger Cause LGDP	27	0.75660	0.4811
LGDP does not Granger Cause LRER		0.33983	0.7156
LGE does not Granger Cause LGDP	27	0.19491	0.8243
LGDP does not Granger Cause LGE		2.40964	0.1132
LTROP does not Granger Cause LFCI	27	2.30929	0.1229
LFCI does not Granger Cause LTROP		1.09836	0.3510
LRER does not Granger Cause LFCI	27	0.42131	0.6614
LFCI does not Granger Cause LRER		1.08795	0.3544
LGE does not Granger Cause LFCI	27	1.17691	0.3269

LFCI does not Granger Cause LGE		6.86397	0.0048
LRER does not Granger Cause LTROP	27	0.49356	0.6170
LTROP does not Granger Cause LRER		0.92124	0.4128
LGE does not Granger Cause LTROP	27	0.32730	0.7243
LTROP does not Granger Cause LGE		1.67437	0.2104
LGE does not Granger Cause LRER	27	0.28062	0.7580
LRER does not Granger Cause LGE		2.92882	0.0745