Empirical Analysis of Private Investments: The Case of Pakistan

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Abstract. Foreign Private Investments include the direct investments and portfolio investments in a particular country. Investments in any country have been linked with the growth terms of the host country. Pakistan is no exception. 24 year secondary data has been used to analyze the impact of foreign private investments on the balance of trade, capital and financial account, and economic growth (GDP) in Pakistan. Independent ADF Test statistic and Granger causality tests have been used through Eviews to generate some results.

Keywords: ADF – Test Statistic, Eviews, Private Investments, ARIMA

1. Introduction

Foreign Private Investments could play a huge role in the economic development of a country, specially for a developing country like Pakistan. Foreign Direct Investments and Portfolio Investments form a part of the Private Investments in a country. Post industrialization period, Pakistan has seen stock market capitalization mostly during 1986-1995. Pakistan has been through a rollercoaster ride as far as the political scenario is concerned. Since investment regimes are often backed by a political scenario, the same upheaval can be seen in Investments scenario and trade balances (imbalances) of Pakistan. The Political and Legal framework can create opportunities for the foreign investors or lead them to fly away. The most fitting example would be of the Asian financial Crisis, which saw capital flying away from the country and it also showed quite clearly the troubles entailed by Foreign Private Investments for the Host country.

Foreign capital flows bring technological knowhow, economic growth, decrease in unemployment and increase in the Purchase power parity of the consumers of the host country is well documented in the Literature. Although Pakistan has witnessed a recent increase in the private investments but the long term affects (positive) are yet to be materialised. Foreign Private Investments may also have negative affects in a country, and the resultant growth may not be at par with the loss incurred through the capital and financial account balances (Salman, 2010). Available literature also suggests that Direct Investment is more stable then the Portfolio Investments, since the latter are more volatile. A healthy mix of both coupled with the right policies may be the answer. Extensive literature is available for the Direct Investments as compared to the Private Investments the data of which is only available after 1986 for Pakistan. Empirical analysis of Private Investments with other economic variables, I want to add to the existing literature of capital flows. The impact on foreign private investments through different variables has been analyzed with the view that it fosters economic growth and vows to find out the negative effect.

2. Empirical Analysis

2.1. Model Framework and Data Sources

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All the possible variables are quoted in the equation. Then, a regression equation based on the analysis of D.W (Durban Watson Statistic), AIC (Akaike Information Criterion) and SC (Schwarz Criterion) is fitted. This research will select indicators affecting the Foreign Private Investments from 1986 to 2009 to establish a model. FPI, KA, BOT and GDP represent foreign portfolio investment account, capital and financial account balance, balance of trade and gross domestic product. The sample is from year 1986 to 2009. The data is in Million ($). In Table V, sample statistics for each of these variables is presented. The related data is taken from Pakistan Handbook of Statistics, Board of Investments and The World Bank. The original model is:

$$FPI = \beta 0 + \beta 1 \ KA + \beta 2 \ BOT + \beta 3 \ GDP + \mu \qquad (1)$$

2.2. ADF-Test Statistic

The Augmented Dickey Fuller Test Statistic is being used independently on each of the variables; to examine the null hypothesis of an autoregressive integrated moving average ARIMA (p, 1, 0) process against the stationary ARIMA (p +1, 0, 0) alternative. Dickey and Fuller (1979) derived the limiting distribution of the ADF test. The testing procedure for the ADF test is the same as for the Dickey–Fuller test but it is applied to the model;

$$\Delta y_t = \alpha + \beta t + \gamma y_{t-1} + \delta_1 \Delta y_{t-1} + \cdots + \delta_{p-1} \Delta y_{t-p+1} + \varepsilon_{t_1}$$

Where α is a constant, β the coefficient on a time trend and p the lag order of the autoregressive process. Imposing the constraints $\alpha = 0$ and $\beta = 0$ corresponds to modelling a random walk and using the constraint $\beta = 0$ corresponds to modelling a random walk with a drift. The unit root test is then carried out under the null hypothesis $\gamma = 0$ against the alternative hypothesis of $\gamma < 0$. The results suggest that each of the economic variables have a unit root in their first order lag differences except FPI and BOT, which are differenced at second and fourth order respectively. Using E views the following regression equation has been analyzed.

$$FPI = \beta 0 + 0.069201 \ KA - 0.116490 BOT + 0.020370 \ GDP - 846.9037 \qquad (2)$$

Variable	Regression Coefficient	Std. Error	t-Statistic	Prob.
BOT	-0.116490	0.155584	-0.748731	0.4627
GDP	0.020370	0.013818	1.474205	0.1560
KA	0.069201	0.116222	0.595420	0.5582
C	-846.9037	598.0318	-1.416152	0.1721
R-squared	0.813229	Mean dependent var		1332.008
Adjusted R-squared	0.785213	S.D. dependent var		1775.879
S.E. of regression	823.0330	Akaike info criterion		16.41488
Sum squared resid	13547667	Schwarz criterion		16.61122
Log likelihood	-192.9786	Hannan-Quinn criter.		16.46697
Durbin-Watson stat	1.620914	Prob(F-statistic)		0.000000
F-statistic	29.02762			

Table 1: Regression Results

The negative sign of BOT suggest that with the private investments increasing there has been a decrease in the trade balance for Pakistan, meaning thereby that the imports have been exceeding. Trade balance consists of exports and imports which both play a dominant role in the determination of the current account balance. Favorable balance of trade means exports are greater than imports and it always supports the current account balance. Negative balance of trade causes a current account deficit. With the private investments entering Pakistan both the capital and financial account and the gross domestic product have been increasing albeit at a very slow rate. It gives us a clue that foreign ownership of securities in Pakistan deteriorates the

trade balance and the improvement is done through the financial account thus engaging Pakistan into a vicious circle.

Residual Plots for Foreign Private Investments:

Normal probability plot of the residual indicates whether the data is normally distributed, outliers exist in the data, and other variables are influencing the predictor. In our model, no evidence of abnormality (not a straight line), outliers (a point far away from the line), skewness (curve in the tails) or unidentified variables (changing slope) are found.
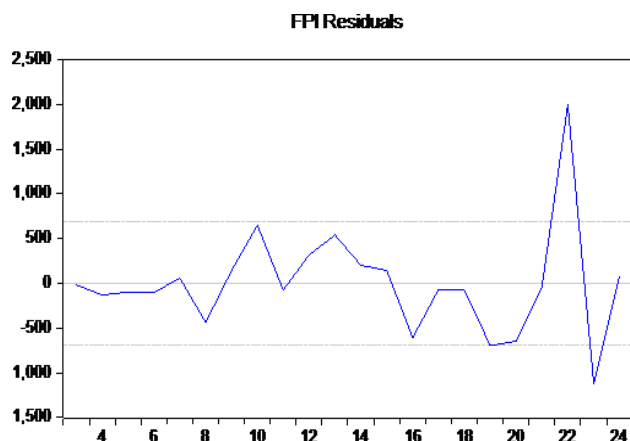

Figure 1

2.3. Granger Causality Test

The test for Granger causality works by first doing a regression of ΔY on lagged values of ΔY. Once the set of significant lagged values for ΔY is found, the regression is augmented with lagged levels of ΔX. Any particular lagged value of ΔX is retained in the regression if it is significant according to a t-test or F-test. Then the null hypothesis of no Granger causality is accepted if and only if no lagged values of ΔX have been retained in the regression.

Pairwise Granger Causality Tests
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
GDP does not Granger Cause FPI	22	2.31348	0.1292
FPI does not Granger Cause GDP		0.95002	0.4063
KA does not Granger Cause FPI	22	3.74524	0.0449
FPI does not Granger Cause KA		6.32159	0.0089
BOT does not Granger Cause FPI	22	1.57490	0.2358
FPI does not Granger Cause BOT		5.56529	0.0138
KA does not Granger Cause GDP	22	2.36684	0.1239
GDP does not Granger Cause KA		5.00815	0.0195
BOT does not Granger Cause GDP	22	2.01278	0.1642
GDP does not Granger Cause BOT		5.23115	0.0170
BOT does not Granger Cause KA	22	2.03926	0.1608
KA does not Granger Cause BOT		2.19559	0.1418

Table II Granger Causality Test

3. Conclusion

From the analysis it has been confirmed that the private investments affect the explained variables allot. The model fits well, and the negative relation of FPI and BOT has come into picture. The results are not extinctive and a positive relationship for Foreign Private Investment with the economic variables by Granger

causality test could not be generated. This may be because of the multiple deficits in Trade Balances. The reason could be that because the foreign private investment is very volatile in nature and since the political risks and the trade risks have been increased considerably post 9/11 era. Earlier work done by (Salman and Hui 2009) also suggested the negative impact of foreign direct investments on the current account balance. And through a more extensive perspective this stance has again been put forward through this research that the increase in private investments is decreasing the BOT for Pakistan and the growth also has been at a slow rate. The Trade imbalances have been a core issue for Pakistan, further research can be carried out in favor of the same with different indicators such as exchange rate, equity and domestic savings.

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Null Hypothesis: KA has a unit root Exogenous: Constant Lag Length: 0 (Automatic based on SIC, MAXLAG=5)			
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.103772	0.6963
Test critical values:	1% level	-3.752946	
	5% level	-2.998064	
	10% level	-2.638752	
MacKinnon (1996) one-sided p-values			

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
KA(-1)	-0.166662	0.150993	-1.103772	0.2822
C	605.6012	606.7169	0.998161	0.3296

Null Hypothesis: FPI has a unit root Exogenous: Constant Lag Length: 1 (Automatic based on SIC, MAXLAG=5)			
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.713421	0.0877
Test critical values:	1% level	-3.769597	
	5% level	-3.004861	
	10% level	-2.642242	
MacKinnon (1996) one-sided p-values			

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
FPI(-1)	-0.339848	0.125247	-2.713421	0.0138
D(FPI(-1))	0.706084	0.245477	2.876373	0.0097
C	412.7158	237.5685	1.737250	0.0985

Null Hypothesis: BOT has a unit root Exogenous: Constant Lag Length: 4 (Automatic based on SIC, MAXLAG=5)		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.173509	0.0379
Test critical values:	1% level	-3.831511	
	5% level	-3.029970	
	10% level	-2.655194	
MacKinnon (1996) one-sided p-values			

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
BOT(-1)	-1.970489	0.620918	-3.173509	0.0073
D(BOT(-1))	1.964758	0.687398	2.858254	0.0134
D(BOT(-2))	2.650021	0.595689	4.448664	0.0007
D(BOT(-3))	1.469668	0.755118	1.946276	0.0736
D(BOT(-4))	1.978486	0.646693	3.059389	0.0091
C	-4682.061	1370.488	-3.416345	0.0046

Null Hypothesis: GDP has a unit root Exogenous: Constant Lag Length: 0 (Automatic based on SIC, MAXLAG=5)		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		2.411541	0.9999
Test critical values:	1% level	-3.752946	
	5% level	-2.998064	
	10% level	-2.638752	
MacKinnon (1996) one-sided p-values			

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
GDP(-1)	0.089625	0.037165	2.411541	0.0251
C	-722.3635	2941.725	-0.245558	0.8084

Table III-IV ADF-TEST Statistic Results

Years	KA	BoT	FPI	GDP	YEARS	BOT	FPI	GDP	KA
1986	1218	-2516	162	31,899	1998	-1418	822	62,192	961
1987	583	-1603	129	33,352	1999	-1596	500	62,974	-2268
1988	1052	-1890	173	38,473	2000	-1691	543	73,952	-4179
1989	1400	-2333	216	40,171	2001	-1476	182	72,310	-643
1990	1775	-1922	212	40,010	2002	-1145	475	72,307	-1107
1991	1630	-1415	237	45,452	2003	-1015	820	83,245	-5213
1992	1060	-2297	554	48,635	2004	-2876	922	97,978	-1978
1993	2712	-3111	443.2	51,478	2005	-6183	1676	109,600	1596
1994	3157	-1725	642	51,895	2006	-12010	3873	127,500	5149
1995	2476	-2224	1532	60,636	2007	-13405	6960	143,171	6599
1996	3968	-3063	1307	63,320	2008	-20196	5429	163,892	13617
1997	2459	-3522	950	62,433	2009	-16891	3209	161,990	9143

Table VII – Variable Data: source (World Bank, Handbook of Statistics; Pakistan)