

## The causal relationship between Foreign Direct Investment and Current Account: an empirical investigation for Pakistan economy

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**Abstract.** *This paper investigates relationship between FDI and current account (CA) in Pakistan using the Johansen-Juselius cointegration technique and the Granger causality test. The study results indicate that FDI and CA are cointegrated and thus exhibit a reliable long run relationship. The Granger causality test findings indicate that the causality between FDI and CA is uni-directional. However, there is no short run causality from FDI to CA and vice versa. Therefore, as a policy implication that FDI inflows may cause to the deterioration of the balance of payments in the long run should be taken into account when policy makers decide to implement policies to attract foreign investors.*

**Keywords:** Asia; Pakistan; Cointegration; Granger; FDI; causality; Current Account.

**JEL Classification:** F21, F41.

**REL Classification:** 8L, 8N, 10F.

## 1. Introduction

Foreign direct investment has been argued to play a key role in accelerating growth in developing countries. Over the past two decades, world saving as a proportion of world income has fallen. As a result saving, real interest rate has declined and inflation rate has risen in the world. It is against this background that foreign direct investment (FDI) has appeared increasingly attractive to developing countries facing declining domestic investment and higher costs of foreign borrowing<sup>(1)</sup>. And as the World Bank (1993, p. 3) claims, there may be dynamic benefits: "Foreign direct investment is a large and growing source of finance that may help developing countries close the technology gap with high-income countries, upgrade managerial skills, and develop their export markets" and this could lead towards a spill over effect in form of improving productive efficiency in the economy. That could be the reason as to why FDI over the last decade have grown at least twice as rapidly as trade Meyer (2003).

However, at the same time, it is also noticed that widening current account deficits is one of the less desirable macroeconomic effects of large capital inflows like FDI. Developing countries normally ran current account deficit problems and the surge in international capital flows to developing countries have coincided with widening current account deficits in many of these countries Calvo et al. (1996). Globally current account imbalances are not strictly the phenomenon of 1990s. Following the oil prices shocks in 1970s, there have been large swings in current account balances of most countries. These imbalances are caused by mismatch between saving and investment. If international capital inflows are used to increase investment, but savings remains stable; this implies an increase in current account deficit. Hence investment and saving and ultimately current account balance may depend on capital flows. And FDI is considered to be a critical component of capital flow. And indeed empirical evidence suggests that FDI flows are significantly correlated with the current account financing requirement<sup>(2)</sup>. Various other studies reached the similar conclusion<sup>(3)</sup>, in contrary few studies like Fry (1993) proved otherwise<sup>(4)</sup>. Jansen (1995) has argued further that the impact of FDI on the current account is further complicated by the investment income payments that arise from FDI<sup>(5)</sup>. And according to UNCTAD (2002), unregulated FDI flows can bring about serious difficulties to balance of payments owing to high import content and profit outflows related to multinational capital.

Pakistan faces problems in financing its current account deficit for last four decades and hence relies heavily on capital flows and as a result Pakistan keen to attract as FDI in all sectors. However most of foreign investment focuses on non tradable, consumption based sectors (like telecom, banking, oil and gas, food,

beverage) instead of tradable sectors that could lead to value addition, exports and enhancing savings. Empirical studies shows that FDI inflows cause domestic output but not exports in Pakistan.<sup>(6)</sup>

Few studies have been conducted to examine the identification of nature and direction of a causal relationship between foreign FDI inflows and current account deficit in the relevant literature.<sup>(7)</sup> However, most of the empirical evidence about the relationship between foreign capital inflows and current account deficit are based on cross-sectional and cross-country analysis. Quite apart from general methodological flaws relating to model specification and econometric procedure, two fundamental limitations make results from any cross-country study on the subject rather dubious. First, cross-country regression analysis is based on the implicit assumption of “homogeneity” in the observed relationship across countries. This is very restrictive assumption. Secondly, given vast difference among countries with respect to nature and quality of data, cross-country comparison is fraught with danger. These considerations point a need for undertaking econometric analysis of individual countries over time in order to build a sound empirical foundation for informing the policy debate. However, there is compelling evidence that many macroeconomics time series are non-stationary and as a result, OLS estimates using these data may produce spurious results. Although by now there exist well-developed techniques for handling non-stationary time series data.

Furthermore, no attempt has yet been made in Pakistan to study the long run causal relationship foreign direct investment and current account by using well developed econometric techniques. This study examines the long run causal relationship between FDI inflows and current account deficit on quarterly data for Pakistan economy over the period 1976-2005.

The plan of the paper is as follows: Section 2 presents an overview of foreign capital inflows in Pakistan; In Section 3, data sources and econometrics methodology is discussed; Section 4 presents and analyzes the empirical findings. And Section 5 and the Section 6 present a concluding summary.

## 2. Overview of FDI and current account in Pakistan

### 2.1. Foreign Direct Investment

In modern times, as countries take advantage of open economy to enhance there growth and development through foreign investment, Pakistan has lagged behind in this field. In past, trade policies of Pakistan have swung between import substitutions and export promotions. Foreign investment was not allowed in the field of banking, insurance and commerce during 1960s. In early 1970s, Pakistan

went for nationalization making the government biggest player in the economy. But afterwards government softens its stance on foreign investments and gradually started allowing the foreign investment in the country. During the 80s, the government initiated market-based economic reform policies. It established Export Processing Zones (EPZs) and special industrial zones (SIZs) for facilitation of export orientated and other industries. These reforms began to take hold in 1988 and late eighties and nineties showed some healthy signs for foreign investments. Since then, government has gradually liberalized its trade and investment regimes by providing incentives to foreign investors through number of tax concessions, credit facilities and tariff. In nineties, government opened the sectors of agriculture, telecommunications, energy and insurance to foreign investors in order to further liberalize its policy. Another factor that augmented foreign investment flow was liberalization of foreign exchange regime by which investors were allowed to bring in, possess and take out earnings and investments whenever they like.

**Table 1**

– in million USD –

Period	FDI	FDI as % GDP	GFDI (%)
76-80	177.6	0.20	
80-85	388.3	0.30	118.60
86-90	877.5	0.60	125.90
90-95	2,087.10	0.90	137.90
96-00	2,984.20	1.20	42.90
00-05	11714.6	1.90	292.60

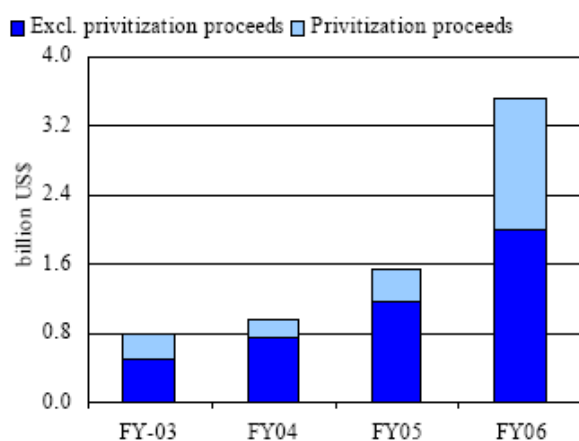
**Note:** GFDI: growth rate of FDI.

**Source:** IMF Stats.

FDI is considered to be a largest component of foreign capital flows in Pakistan. Table 1 indicates actual inflows have increased sharply over the years. Pakistan have received considerably higher amount of FDI flows over the last two decades, especially during the decade of 1990s, where market openness, and focus on private sector for economics growth, created an environment of investment conduciveness, here investment largely concentrated in agriculture and energy sector. Just in 1995, FDI flows have increased about 50% from 0.8% of GDP to 1.25% amounting to \$ 722.65 million.

There also were some brief periods where FDI flows depicted negative growth, specially during 1997 to 2000, where in decreased about 200% from FDI flows of \$ 922 million in 1996 to \$ 308 million in 2000. This could be due to economic instability, because of economic sanctions by world powers in wake of testing of nuclear devices. Perhaps the major reason was freezing of foreign currency accounts, which greatly shattered confidence of foreign investors. Periods of 1998

to 2000 showed that economy was in recession but it soon followed by a sharp revival after 2002 as a result of aggressive economic reforms, which revive the confidence of foreign investors and provides sound ground for reintegration into world economy. FDI flows increased from \$ 308 million in 2001 to \$ 2.18 billion in 2005 with cumulative increase of about 600%. In the same period Pakistan GDP also increased about 50%. This trend is continuing till present.



Source: IMF Stats.

**Figure 1.** Foreign direct investment

During Fiscal Year (FY) 06, FDI flows into Pakistan more than doubled from the preceding year, sustaining a 5-year trend. In fact, even adjusting for the privatization transactions, FDI flows in FY06 amounted to US\$ 2.0 billion, registering a sharp rise of 70.6 percent over the preceding year. Also during FY06 privatization proceeds have registered an unprecedented rise to US\$ 1.5 billion (see Figure 1) mainly on account of power, finance & insurance and oil & gas exploration and telecommunication sectors. Privatization is comparatively a new phenomenon and foreign Privatization proceeds, which were non-existence before 2002, suddenly jumped to \$ 1.1 billion in 2003 and trend seems to hold up. Particular, the telecommunications sub-sector fetched more than half of the FDI during FY06 compared with about one-third FDI under this head in FY05.

## 2.2. Current account

Pakistan's current account balance that slipped into red in 2004-05 after posting surpluses for three consecutive years remained in deficit in 2005-06 with gap continued to widen. In FY06, the current account deficit (excluding official

transfers) stood at \$ 4696 million in the first nine months (July-March) of the current fiscal year as \$ 1181 million in the same period last year. As percentage of projected GDP for the year FY06, the current account deficit stood at 3.7 percent as against 1.1 percent in the same period last year. Although trade deficit almost doubled over the last year and services balance deteriorated by 27.5 percent, the strong inflows under private transfers fueled by rising workers' remittances and resident foreign currency accounts offset some of the negatives with current account deficit standing at \$ 4696 million.

**Table 2.** *Current account balance*

– in million USD –

Items	FY04	FY05	FY06	Yr to Yr change FY06
1. Trade balance	-1,279	-4,514	-8,442	-3,928
Exports	12,459	14,482	16,506	2,024
Imports	13,738	18,996	24,948	5,952
2.Services ( net )	-1,316	-3,293	-4,402	-1,109
Transportation	-890	-1218	-1790	-572
Travel	-1034	-995	-1,185	-190
Communication services	166	272	97	-175
Other business services	-332	-2,217	-2,552	-335
Government services	905	1,041	1,359	318
Other	-131	-176	-331	-155
3.Investment income (net )	-2,207	-2,386	-2,671	-285
Direct investment	-1,215	-1,622	-2,076	-454
Portfolio investment	-201	-154	-95	59
Interest Payments on Official and Private External Debt	-839	-764	-749	15
Others	48	154	249	95
4. Current transfers ( net )	6,614	8,659	10,516	1,857
Private transfers	6,102	8,409	9,837	1,428
Workers remittance	3871	4168	4600	432
Foreign Currency Accounts – residents	367	521	312	-209
Others	1864	3720	4925	1,205
Official transfers	512	250	679	429
Current account balance	1,812	-1,534	-4,999	-3,465

**Source:** SBP.

*Trade Balance:* The deficit in the trade account worsened sharply to US\$ 8.4 billion in FY06 as compared to a FY05 deficit of US\$ 4.5 billion (See Table 2). This expansion was primarily due to a significant 31.3 percent year to year growth in imports that outpaced the 14.0 percent growth in exports.

*Services (net):* Services account deficit widened by US\$ 1.1 billion to US\$ 4.4 billion in FY06 as compared to last year. Moreover, the outflow under travel also accelerated sharply, while inflow in the communication services witnessed a fall during FY06.

**Table 3. Income outflows**

– in million USD –

Period	IF	Avg. Yearly IF	IF as % of GDP	GIF (%)
76-80	-1304.02	-260.80	-1.46	
80-85	-2853.79	-570.76	-2.45	118.85
86-90	-4867.81	-973.56	-3.12	70.57
90-95	-8310.40	-1662.08	-3.77	70.72
96-00	-11122.14	-2224.43	-4.27	33.83
00-05	-12764.05	-2552.81	-2.97	14.76

**Note:** IF- Income Outflows; GIF- Growth in income outflows.

**Source:** IMF Stats.

*Income (net):* investment income mainly constitute of three major heads i.e. direct investment, portfolio investment and other investments. Average yearly income outflows were \$ 260 million in 1976-80. It then gradually increased to \$ 570 million and then 973 million in periods of 1980-85 and 1985-1990 respectively (Table 2). This trend further increased in the decade of 90s, with average outflow of about \$ 1.6 billion in 1990-95 and about \$2.3 billion in 1995-00.

During FY06 alone, the net income deficit further expanded by 12.0 percent year to year to US\$ 2.7 billion. Direct investment outflows recorded an increase due to rise in payments made by the government to foreign oil and gas exploration as well as the higher repatriation of profits and dividend by foreign banks and companies operating in Pakistan. The rise in the profits and dividends is a result of continuous rise in the banking sector profitability. The only difference is that while in FY05, the outflows were on account of repatriation of profits, in FY06 the outflows are due to dividends repatriation. Other investment outflows reflect payments on external debt and liabilities and returns on investment of official forex reserves. During FY06 despite the rise in interest payments on external debt and liabilities, net payments decreased by US\$ 82.0 million.

*Current Transfers (net):* Current transfers includes both the private transfers as well as official transfers. Private transfers are largely made up of net change in foreign currency accounts, workers remittances and others mostly on account of exchange companies. Current transfers increased by 21.4 percent to US\$ 10.5 billion during FY06 (Table 2). During FY06, resident foreign currency accounts registered lower inflows of US\$ 312 million as compared to the US\$ 521 million seen in FY05. However remittances have more than quadrupled since FY00 averaging US\$ 4.2 billion since 2003. FY06 also witnessed a sharp increase in other private transfers (credit) as they reached US\$ 5.0 billion, recording 31.1 percent growth year to year, the most prominent part was private donations of US\$ 402 million witnessed in FY06 from US\$ 150 million last year. This probably reflects contribution for earthquake relief activities.

### 3. Data source and methodology

#### 3.1. Data source

Data for foreign direct investment (FDI) and current account (CA) are obtained from various issues of International Financial Statistics (IFS) and Economic Survey of Pakistan (various issues). Consumer price index is used to convert the data into real term. The sample range is 1976Q1 up to 2005Q4, which comprises 116 observations.

#### 3.2. Econometric methodology

##### **The following sequential procedure will be adopted**

###### *Step 1: Unit root test and order of integration*

It is important to determine the stationary properties of time series before we proceed with the multivariate analysis. To examine whether a time series have a unit root, this paper has used Augmented Dickey-Fuller (ADF) unit root test. The critical value for this test is provided by MacKinnon (1991).

###### *Step 2: Cointegration analysis*

The second step is to identify whether all the variables that are included in the system are cointegrated, i.e. tied in a long run relationship. A widely used approach is Johansen's (1988) and Johansen and Juselius (1990) procedure based on "Maximum Likelihood method" and "eigen value statistics" to confirm the existence of long run relationship among all tested variables. Cointegration is said to exist if the values of computed statistics are significantly different from zero. Thus, variables if found to be cointegrated, implies that there exist a linear, stable and long-run relationship among variables, such that the disequilibrium errors would tend to fluctuate around zero mean. This means that variables tend to move together to its steady state path in the long run.

###### *Step 3: Vector error-correction modeling (VECM)*

The purpose of the VECM is to focus on the short run dynamics while making them consistent with long run solution. If a number of variables are found to be cointegrated with at least one cointegrating vector, then there always exists a corresponding error-correction representation which implies that changes in the dependent variable can be formulated as a function of the level disequilibrium in the cointegration relationship and fluctuation in other explanatory variables. In other words the error-correction term in the VECM provides additional channel for the detection of Granger causality. The Granger causality can be detected through the statistical significant of t-test for the lagged error correction term and



of the F-test applied to joint significance of the sum of lags of each explanatory variables. The non-significance of both the t-and F-test in the system indicates econometric exogeneity of dependent variable. In addition to indicating the direction of causality amongst variable, the VECM also allows us to discriminate the short-run and long-run Granger causality. The F-test of the explanatory variables (in their first differences) indicates the “short-run” causal effects, whereas the “long-run” causal relationship is implied through the significance of the t-test of the error correction term, since it contains long-run cointegration information between the variables, because it is derived from the long-term cointegration relationship(s).

#### 4. Empirical results and analysis

The Johansen co-integration method and vector error-correction model technique has been used in order to examine the long run and the short run dynamic of system respectively.<sup>(8)</sup>

Prior to testing the long run co-integration relation, it is necessary to establish the order of integration presented. To this end, an Augmented Dickey Fuller (ADF) was carried out on the time series levels and difference forms. The results are given in Table 4 and as this table shows, all the variables have a unit root in their levels and are stationary in their first difference. Thus two variables (FDI and CA) are integrated of order one I(1).

**Table 4.** Test of the unit root hypothesis

Variables	Level		First difference	
	t-statistics	k	t-statistics	k
FDI	-1.14	1	-7.69*	3
CA	-2.42	4	-4.81**	3

The optimal lags (k) for conducting the ADF test were determined by AIC (Akaike information criteria).

\*\* and \* indicate significance at the 5% and 1% levels, respectively.

**Note:** The t-statistic reported in is the t-ratio on  $\gamma_1$  in the following regression.

$$\Delta X = \gamma_0 + \gamma_1 X_{t-1} + \sum_{i=1}^p \beta \Delta X_{t-i} + \gamma_3 T + u_t.$$

Given the common integration properties of variables under consideration the next stage to test the presence of multilevel cointegration in the two dimensional VAR model (FDI and CA) by employing the Johansen (1988) and Johansen and Juselius (1990) procedure using the trace statistic and maximal eigenvalue test. The  $\lambda$  trace statistic indicating that there exist one cointegrating vector, with null

hypothesis of no cointegration ( $r=0$ ) among the variables, the trace statistic is 40.94 exceeds the 99 per cent critical value of the  $\lambda_{\text{trace}}$  statistic (critical value is 30.45), it is possible to reject the null hypothesis ( $r=0$ ) of no cointegration vector, in the favour of the general alternative  $r \geq 1$  (Table 5). Similarly, On the other hand,  $\lambda_{\text{max}}$  statistic reject the null hypothesis of no cointegration vector ( $r=0$ ) against the alternative ( $r=1$ ) as the calculated value  $\lambda_{\text{max}}(0,1) = 36.64$  exceeds the 99 per cent critical value (23.65). The finding of cointegration has several implications. First, the presence of one cointegration vector shows that there exists a long run relationship between the variables. Second, this evidence of cointegration between these two variables rules out spurious correlations and also implies at least one direction of Granger causality.

Regression analysis deals with dependence of one variable on the other variables; it does not necessarily imply causation. In other words existence of a relationship between variables does not prove causality or direction of influence.

**Table 5.** Johansen's test for multiple cointegration vectors

Co-Integration Test Between [FDI CA]					
	H0:	H1:	Tests Statistics	95%Critical values	99%Critical values
	$\lambda_{\text{trace}}$		$\lambda_{\text{trace}}$		
	$r = 0$	$r > 0$	40.94	25.32	30.45
	$r \leq 1$	$r > 1$	4.30	12.25	16.26
	$\lambda_{\text{max}}$ values		$\lambda_{\text{max}}$ values		
	$r = 0$	$r = 1$	36.64	18.96	23.65
	$r = 1$	$r = 2$	4.30	12.25	16.26

Engle and Granger (1987) demonstrated that once a number of variables are found to be cointegrated, there always exists a corresponding error correction representation which implies that changes in the dependent variable are a function of level of disequilibrium in the cointegration relation (capture by the error-correction model) specifies that the first differences of all I(1) variables are function of the lagged differences of all these terms in addition to lagged equilibrium error terms. In this respect, since the error-correction term is stationary, all variables in this model are also stationery. This implies that OLS standard errors will also consistent and efficient. As stated earlier, cointegration cannot detect the direction of causality that is indicated by the VECM (Table 5). The short run dynamics will be captured by individual coefficients on the difference terms. The inclusion of error correction term makes it possible to distinguish the short run causality from the long run causal relationship. Evidence of cointegration between variable will rule out the possibility of Granger non-causality and will imply that there must be at least one instance of Granger causality either unidirectional or bi-directional (Granger, 1986, 1988). The error

correction model representation of the Granger causality model with two variables is given in following equations.

$$\Delta CA = C_1 + \sum_{m=1}^{p_1} \alpha_m \Delta CA(-m) + \sum_{m=1}^{r_1} \beta_m FDI(-m) + \Phi_1 E(-1) \dots\dots\dots E(1)$$

$$\Delta FDI = C_2 + \sum_{m=1}^{p_2} \lambda_m \Delta CA(-m) + \sum_{m=1}^{r_2} \gamma_m FDI(-m) + \Phi_2 E(-1) \dots\dots\dots E(2)$$

Before implementing the Granger causality test one has to choose the order of lags. There is evidence that the causality tests are often sensitive to choice of lag lengths. In literature there exist a number of suggested methods for choosing the lag orders. Here an Akaike information criterion has been used. This suggests two lags of each variable.

From the estimated results reported in Table 6, it is evident from the table that error correction term is only significant in current account equation (1). So FDI Granger causes the CA in the long run. The error correction term is not significant in FDI equation (2). Thus, CA does not cause FDI in long run.

The results indicate that the long run causality between current account and foreign direct investment is uni-directional: there is only one-way long run causality from FDI to CA; however, no long run causality, in the Granger sense, was found in opposite direction. This indicates that foreign direct investment causes current account imbalance in Pakistan. The estimated p-value of joint test shows that lags of FDI are insignificant in CA equation and lags of CA are insignificant in FDI equation. Thus there is no short run causality from FDI to CA and vice versa.<sup>(9)</sup>

**Table 6.** Granger causality test

Causality	Test of Joint Significance	Error-Correction
		Term
$\Delta CA$ Equation		
CA		
H0	$\beta_1 = \beta_2 = 0$	$\phi_1 = 0$
P-value	0.34	0.01
$\Delta FDI$ Equation		
FDI		
H0	$\lambda_1 = \lambda_2 = 0$	$\phi_2 = 0$
P-value	0.51	0.32

**Source:** Authors' calculations and estimation.

Econometric problems of serial correlation, heteroscedasticity, functional form and normality of the VECM are examined through the standard diagnostic tests (Table 7), in each case the null hypothesis could not be rejected at conventional 5% level of significance, implying thereby that our results are statistically free from any specification problems.

**Table 7**

Summary of Diagnostics for VECM		
	<i>E(1)</i>	<i>E(2)</i>
	$\Delta(CA)$	$\Delta(FDI)$
Diagnostic Tests		
<i>Serial Correlation</i>	0.35	0.22
<i>Heteroscedasticity</i>	1.34	0.16
<i>Functional Form</i>	0.55	0.58
<i>Normality</i>	0.21	0.42

## 6. Conclusions

In this paper, we have examined the question of whether foreign direct investment, Granger-cause current account deficits or *vice versa*. This paper has examined the long run relationship between foreign direct Investment and current account in Pakistan using quarterly data for the period 1976-2005. The empirical investigation consists of: (1) the application of cointegration analysis to ascertain the long run relationship between FDI and CA (2) the determination of the direction of causality among the variables in the context of vector error correction model.

Our results indicate that FDI and CA are cointegrated and thus exhibit a reliable long run relationship. The results indicate that the causality between FDI and CA is uni-directional: There is only one-way long run causality from FDI to CA; however, no long run causality, in the Granger sense, was found in opposite direction. Similarly, there is no short run causality from FDI to CA and vice versa.

Therefore, as a policy implication, we should stress the fact that the significant effects that FDI inflows may cause to the deterioration of the balance of payments in the long run (due to profit remittance)<sup>(10)</sup> and should be taken into account when policy makers decide to implement policies to attract foreign investors. In case of Pakistan, these investments could not contribute towards income generating activities; rather raising conspicuous import based consumption, making high returns and repatriating the proceeds back home. Hence the economic activities generated by these investments are not sustainable leading to low future growth and high present inflation through pressurizing the exchange rate and making current imports, which are largely inelastic, more expensive. Hence foreign investment flows in tradable sectors such as exports should be

encouraged where value addition and enhancing peoples' real income and savings should be preferred. Where the foreign capital flows would instead of causing pressure on current accounts, produce export proceeds through value addition. Here Foreign Investments could be beneficial since profit outflows would matched or even less than the export based inflows hence making positive impact on current account.

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### Notes

- (1) In 1997 FDI accounted for 45 percent of net foreign resource flows to developing countries, compared with 16 percent in 1986 Perkins (2001).
- (2) See Philip Turner (1991) and Bosworth and Collins (1999).
- (3) See Chuhan et al. (1996), Sarno and Taylor (1999) and the World Bank (1999a).
- (4) This study long-term capital flows appear to be just as sensitive to current account financing requirements as short-term flows. It ranks portfolio investment as the most autonomous, FDI to the public sector next, and both long- and short-term bank loans as the most accommodative type of capital in the sample of developing countries.
- (5) See Athukorala and Menon (1995) for positive impact. For a critical perspective of FDI, see Agosin and Mayer (2000).
- (6) See Ahmad and Mohsin (2004).
- (7) See Fry et al (1995), Seabra, F. et al. (2005).
- (8) The Johansen-Juselius (1990) can find multiple cointegrating vectors; Engle-Granger approach has several limitations in the case of more than one cointegration vector.
- (9) The estimates of coefficients and the sum of coefficients in the Granger causality exercise are not reported in the text. However, they are available upon request.
- (10) Average annual Income flow for the past nine years on account of earnings repatriation amounts to \$ 1060 million (value arrived from that data taken from SBP).

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