Capital Account Openness and Economic Growth Nexus: the Case Study of Pakistan

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Abstract

The present study explores the relationship between capital account openness and economic growth in a small developing economy like Pakistan not only in long run but also in short runs. To obtain reliable interpretations, we utilized an advanced Autoregressive Distributive Lag (ARDL) technique for long run relationship and error correction model (ECM) for short run dynamics. Our findings suggest that capital account openness promotes economic growth in long run. Monotonic (Non-linear) relationship between the said variables also proves our hypotheses that a non-Linear U-shaped relationship exists between the variables. Economic growth is influenced through previous economic policies. Inflation decelerates economic growth while improvements in investment activities boost economic growth. Financial sector's development stimulates economic growth and increase in human capital formation enhances the long run sustainable growth potential of the country.

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Introduction

In the era of economic integration, most of the developing and developed countries not only open their borders for trade of goods and services, ideas, technology, information, etc. but also open capital accounts that have virtually made the world a global village. During the 1980s and 1990s, a large amount of capital moved internationally from private investors in the whole world. It took place primarily through sale of bonds and equities and international investment by multinational corporations[2]. Thus, globalization of finance and efficient allocation of capital stimulated growth in developing countries significantly. It is the nature of capital to move from places where it is plentiful to where it is scarce, provided there is no barrier to cross the border. Return on new investment is higher where capital is scarce. This is an incentive for people to save more (leading to enhanced capital formation) in developing countries as these countries are in general capital poor. For the same reason, foreign individuals and companies seek to invest their surplus capital in developing countries. Thus, this channel in turn, can help the recipient countries to accelerate their growth rate and subsequently improve their living standard (Lieehetta, 2006; Gupta, 2007). In this paper, we make an effort to see to what extent it is true for Pakistan.

Review of Literature:

Butkiewicz,-James-L; Yanikkaya,-Halit (2003) support the argument that the capital account liberalization benefits developed countries while capital flow restrictions are likely to reduce the benefits of foreign direct investment (FDI) on growth in developing world. This shows that developed countries with higher capital inflows lead to grow faster in long span of time due to having good human resource stock, which confronts the belief that countries must have

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[2] Capital mobility though the use of capital inflows and outflows to rest of the world of a nation, either a percentage of GDP by Karray, (1998). Lane and Milesi-Ferretti (2001); by using an annual measure of portfolio and direct investment, assets, and liabilities as a percentage of GDP measure of financial openness (IMF 2001; O, Donnell, 2001; and Edison and others; 2002.) For example, level of trade openness, which is typically calculated as the sum of imports plus exports over GDP, the Lane and Milesi-Ferretti measure is a good indictor of openness at a point in time So we use the capital account, which is calculated by goods and services, income, unilateral transfers and financial flows of capital.

attained a better level of development of resources or human capital to obtain benefits from capital inflows.

Razin,-Assaf; Rubinstein,-Yona (2006) establish two well-known puzzles in international macroeconomics literature. The first is the lack of systematic differences in the macroeconomic performance across exchange rate regimes. The second is the absence of a clear empirical relationship between macroeconomic performance and capital-account liberalization. They argue that negative findings might be due to empirical methods that fail to account for a cloaked economic crisis prejudiced by exchange rate and capital account regimes. Edison et al (2002) recognize the differences in the results of the various studies and provide some support for a positive impact of capital account openness on economic growth and development, especially for developing countries. Klein (2003) utilizes quadratic interaction between income per capita and capital account openness or financial liberalization and[3] establishes a positive and significant link between capital account openness and economic growth through stock market liberalization for middle-income countries but not for poor and rich countries. Similarly, Hauskrecht et al, (2005) put emphasis on a significant positive correlation between capital account liberalization and growth process. In order to achieve desired rate of growth through capital account liberalization, prudent sequencing of capital account liberalization and strong domestic institutions-- such as an independent central bank, proper financial regulation, management and macroeconomic stability, etc. are necessary pre-conditions[4]. In small, open economies, absorption capacity for capital is limited because the financial markets are impulsive. The excessive capital inflows toward small open economies might cause Dutch disease phenomenon and asymmetric information might be result in inefficient use of capital (Carlos et al, 2001; Hauskrecht et al, 2005).

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[3] The results support the view that poor countries lack the legal, social, and political institution necessary to enjoy fully the benefits of capital accounts liberalization.

[4]These types of studies explained by Se-Hark Pak (1995), Hans Singer (1996), Sanjay Lall, (1990). They argued that the developing countries must build up infrastructure before undertaking liberalization i.e enhancing supply capabilities, time phased relaxation of import controls, opening of domestic markets for foreign suppliers, rationalizing tariff structure, establishing a realistic exchange rate. They give the example of Japan, South Korea Taiwan and some other Asian countries. Daseking et al (2004) also explained the Sequences in Financial Liberalization in the Emerging-Market Economies

Contrary to this, Ciftcioglu,-Serhan (2005) investigate two additional mechanisms through which increased net capital inflows exerted negative impact on economic growth. Sami Mohamed (2007) finds that exchange rate regime is also an important factor for external competitiveness and domestic inflation, to correct the balance of payment disequilibrium and to promote a policy of economic growth. These simulating outcomes reveal that capital account liberalization is compatible with a flexible exchange rate regime. Omar (2002) scrutinizes the impact of liberalization and economic growth in Bangladesh and suggests that financial liberalization has significant negative impacts on economic growth. Trade openness and capital account liberalization have also insignificant impact on economic growth due to weak supply response and lack of credibility of such reform programs[5].

Peter Henry (2000) analyzes the relationship between capital account liberalization, capital cost and economic growth. He finds that the developing economies, to some extent, benefit from liberalized stock markets because their cost of capital falls, as investment market booms and worker productivity increases. Khalid (2001) empirically establishes that regardless of their stages of economic development, countries would benefit from capital openness to the extent they liberalize their stock markets. Khalid (2004) finds a mixed result about the relationship between financial liberalization and certain deregulation policies on saving, investment, and growth in Pakistan. He concludes that the liberalization policies has little impact on positive effect of financial openness and economic growth. His findings further suggest that after many years of liberalization policies, most of the indicators of the financial liberalization do not have significant impact on saving, investment, or growth.

Many studies find no significant relationship between openness of capital account and economic growth of the economy. For example, Grilli and Ferretli (1995) does not support the hypothesis that capital account openness promotes economic growth. Rodrik (1998), observs no significant tie between capital account liberalization and investment to income or between capital account liberalization and growth. Kraay (1998) reveals no significant relationship

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[5] Rashid (2000) establish positive link between trade liberalization on manufacturing growth. Ahmad (2001) also found positive effect of trade liberalization on economic growth. Mamun and Nath (2004) investigated the link between exports to growth. For more detail to see the similar finding were reported by Wacziarg and Welch (2003), Dollar, kraay(2004), Chang et al (2005) and Salinas and Aksoy (2006).

between capital account liberalization and growth. Like-wise, Edison (2002) concludes that there is no relationship between capital account liberalization and growth and suggests that financial integration does not promote economic growth per se, when controlling for some economic, financial, institutional, and policy characteristics. He argues further that "low level of government interventions (low rent seeking) are optimistically associated with international financial integration, with better level of real per capita GDP, educational targets, banking sector development, stock market development, and law-and-order tradition". Hali et al (2004) find that most of the industrial countries have a more liberalized capital accounts policy toward developing economies, while the majority of developing countries keep controls over the capital flows. According to Edward (2001) capital account liberalization has different impact in developed and developing economies. Government may wait to open the capital account until they have first succeeded to control the instability of macroeconomic activity in the economy, because the unstable policies cause the capital flight in newly-opened economies. While, the positive impact of capital account liberalization on economic growth may reflect the growth-supported effects of macroeconomic stabilization.

Model and Data Collection

This study investigates the impact of capital account liberalization on economic growth in the case of a small developing country like Pakistan. Time series data for Pakistan 1971 to 2006 are employed in order to investigate the relationship between capital account openness and economic growth. The present study investigates both short-run as well as long-run relationship between capital account openness and economic growth for Pakistan. To obtain reliable interpretations, we utilize advanced techniques such as ARDL for long run relationship and ECM for short run dynamics.

Relationship between economic growth and capital account liberalization is given below as equation;

$$LGDPC = \alpha_{\circ} + \alpha_1 LCA + \alpha_2 CV + \varepsilon_t \qquad \text{................. (1)}$$

Where *CA* represents capital account openness, GDPC is GDP per capita while CV means control variables in the models such as inflation (*INF)*, investment as share of GDP (*INV*), secondary enrollment proxy for human capital (EDU) and market capitalization (*MC*) proxy for financial development. The main focus of this investigation is capital account openness, which is based upon the debate of earlier theoretical models linking capital account openness to

15

economic growth; the following functional form (Non-monotonic) is being assumed:

$$\alpha_{11}LCA + \alpha_{12}LCA^2$$

The growth-declining hypothesis predicts $\alpha_{11}<0$ and $\alpha_{12}= 0$, the growth-improving hypothesis predicts $\alpha_{11}>0$ and $\alpha_{12}= 0$, and inverted U-shaped hypothesis predicts if $\alpha_{11}>0$ and $\alpha_{12}<0$, if $\alpha_{11}<0$ and $\alpha_{12}>0$ U-shaped hypothesis predicts.

Table-1
Descriptive Statistics and Correlation Matrix

Variables	GDPC	CA	INF	INV	EDU	MC
Observations	36	36	36	36	36	36
Skewness	0.2927	-0.8425	0.4123	-1.8677	0.4225	2.7228
Kurtosis	2.3395	2.4151	2.6571	7.0230	1.6061	10.9401
GDPC	**1.0000**					
CA	0.8412	**1.0000**				
INF	-0.5903	-0.4228	**1.0000**			
INV	0.1964	0.2885	-0.2592	**1.0000**		
EDU	0.9195	0.8371	-0.4014	0.0566	**1.0000**	
MC	0.7701	0.5479	-0.3483	-0.0279	0.7472	**1.0000**

Table-1 indicates the pair-wise correlations among variables in the concerned model, capital account liberalization; human capital and stock market capitalization positively and significantly correlate with economic growth while inflation retards it and weak association between investment & economic growth. Data of all said variables have been collected from International Financial Statistics and Economic Survey of Pakistan (Various issues).

Methodological Framework

Most researchers use ADF (Dickey & Fuller, 1979) and P-P (Philip & Perron, 1988) test to find out the order of integration. Due to its poor size and power properties, these tests are not reliable for small sample data (Dejong et al, 1992 and Harris, 2003). They conclude that these tests seem to over-reject the null hypotheses when it is true and accept it when it is false. While the two newly

proposed tests seem to solve this problem, the Dickey-Fuller Generalized Least Square (DF-GLS) de-trending test as developed by Elliot et al.(1996), by and Ng-Perron test following Ng-Perron (2001).

On the assumption that there is need to test the order of integration of variable X_t, Elliot et al. (1996), enhance the power of ADF test by de-trending procedure and DF-GLS test is based on null the hypothesis

$$H_{\circ} : \delta_{\circ}^* = 0 \text{ in the regression:}$$

$$\Delta X_t^d = \delta^* X_{t-1}^d + \delta_1^* \Delta X_{t-1}^d + \ldots\ldots + \delta_{p-1}^* \Delta X_{t-p+1}^d + \eta_t \ldots\ldots\ldots(2)$$

where X_t^d is the de-trended series and the null hypotheses of this test is that X_t has a random walk trend, possibly with drift as follows.

$$X_t^d = X_t - \overset{\frown}{\varphi}_{\circ} - \overset{\frown}{\varphi}_1 t \ldots\ldots\ldots(3)$$

Basically, two hypotheses are proposed, (i) X_t is stationary about a linear time trend and (ii) it is stationary with a non-zero mean, but with no linear time trend. Considering the alternative hypotheses, the DF-GLS test is performed by first estimating the intercept and trend utilizing the generalized least square technique. This estimation is investigated by generating the following variables:

$$\bar{X} = \left[X_t, (1 - \bar{\beta} L)X_2, \ldots\ldots\ldots, (1 - \bar{\beta} L)X_T \right]\ldots\ldots(4)$$

$$\bar{Y} = \left[X_t, (1 - \bar{\beta} L)Y_2, \ldots\ldots\ldots, (1 - \bar{\beta} L)Y_T \right]\ldots\ldots(5)$$

and

$$Y_t = (1,t) \bar{\beta} = 1 + \frac{\bar{\alpha}}{T} \ldots\ldots\ldots \ldots\ldots(6)$$

where "T" representing number of observation for X_t and $\bar{\alpha}$ is fixed[6]. While OLS estimation is followed by this equation:

$$\bar{X} = \varphi_{\circ}\,\bar{Y} + \varphi_1 Y_t + \varepsilon_t \ldots\ldots\ldots(7)$$

and OLS estimators $\bar{\varphi}_{\circ}$ and $\bar{\varphi}_1$ are utilized for the removal of trend from as X_t above. ADF test is employed on the transformed variable by fitting the OLS regression[7]:

$$\Delta X_t^d = \lambda_{\circ} + \rho X_{t-1}^d + \sum_{j=1}^{k} \gamma_j \Delta X_{t-j}^d + \mu_t \ldots\ldots\ldots(8)$$

In alternative hypothesis, $\bar{\alpha} = -7$ in the required equation of $\bar{\beta}$, above, then they calculate $X_t^d = X_t - \varphi_{\circ}$, fit the ADF regression on new transformed variable and employ the test of the null hypothesis that is $\rho = 0$.

In recent times, Ng-Perron (2001) developed four test statistics utilizing GLS de-trended data D_t^d . He calculated values of these tests based on forms of Philip-Perron (1988) Z_{α} and Z_t statistics, the Bhargava (1986) R_1 statistics, and the Elliot, Rotherberg and Stock (1996) created optimal best statistics. The terms may be defined as follows:

$$k = \sum_{t=2}^{T} (D_{t-1}^d)^2 / T^2 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(9)$$

While de-trended GLS tailored statistics are given below:

$$MZ_a^d = (T^{-1}(D_T^d)^2 - f_{\circ})/(2k)$$

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[6] The power of envelop curve is one-half at $\bar{\alpha} = -13.7$ when the model has constant and trend term, and at $\bar{\alpha} = -7$ when it has only constant tern (see Elliot et al., 1996 for comprehensive study)

[7] For the critical values see (Elliot et al., 1996) of null-hypothesis which is $\rho = 0$.

$$MZ_t^d = MZ_a \times MSB$$

$$MSB^d = (k/f_\circ)^{1/2}$$

$$MP_T^d = \left\{ (\overline{c}^{-2}k - \overline{c}\,T^{-1}(D_T^d)^2 / f_\circ, and, (\overline{c}^{-2}k + (1-\overline{c})T^{-1}(D_T^d)^2 / f_\circ \right.$$

(10)

If $x_t = \{1\}$ in fist case and $x_t = \{1,t\}$ in second[8].

ARDL Bounds Testing

We have employed the autoregressive distributed lag (ARDL) bounds testing approach suggested by Pesaran et al. (2001) as the most appropriate specification to carry out co-integration analysis among capital account openness and economic growth plus other explanatory variables. The bounds testing approach has numerous advantages. The main merit lies in the fact that, unlike other widely used co-integration techniques, it can be applied irrespective of whether the variables are integrated of order *I(0)* or integrated of order *I(1)*. Fortunately, ARDL method is free of any problem faced by traditional techniques in the literature. Another merit is that, it has better small sample properties. Moreover, a dynamic error correction model (ECM) can be derived from the modified ARDL model through a simple linear transformation (Banerrjee et al. 1993). The ECM integrates the short-run dynamics with the long-run equilibrium without losing long-run information.

The modified ARDL approach to co-integration involves estimating the conditional error correction version of the ARDL model as follows:

$$\Delta y = \lambda_1 + \lambda_2 y_{t-1} + \lambda_3 z_{t-1} + \lambda_4 x_{t-1} + \sum_{i=1}^{p} \gamma_i \Delta y_{t-1} + \sum_{j=0}^{p} \alpha_i \Delta x_{t-j} + \sum_{s=0}^{p} w_s \Delta z_{t-s} + \mu_i ..(11)$$

where $\lambda_\circ$ is the drift component and μ is assumed to be white noise error processes. The ARDL approach estimates $(p+1)^k$ number of regression in order to obtain optimal lag length for each variable, where '*p*' is the maximum number of lags to be used and "*k*" is the number of variables in the Equation-

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[8] $\overline{\alpha} = -7$, If $x_t = \{1\}$ and $\overline{c} = -13.7$ $\overline{\alpha} = -7$, If $x_t = \{1,t\}$

11. The optimal lag structure of the first difference regression is selected by the Schwarz-Bayesian criteria (SBC) to ensure an absence of serial correlation in the estimated residual[9]. Following Pesaran et al (2001), two separate statistics are employed to "bound test" for the existence of along-run relationship --an *F-test* for the joint significance of the coefficients of lagged levels in Equation 11 (so that the null hypothesis $H_\circ : \lambda_2 = \lambda_3 = \lambda_4 = 0$ means no evidence of existence of long run relationship while alternative hypothesis is $H_1 : \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq 0$ indicates the existence of long run relationship among relevant variables embodied in the model Two asymptotic critical value bounds provide a test for co-integration when the independent variables are *I(d)* (Where $0 \leq d \leq 1$) --a lower assuming the regressors are *I(0)*, and an upper value assuming purely *I(1)* regressors.

If the F-statistic exceeds the upper critical value, we can conclude that a long run relationship exists regardless of whether the underlying order of integration of the variables is *I(0)* or *I(1)*. If the *F*-statistic falls below the lower critical values, we cannot reject the null hypothesis of no co-integration. If the *F*-statistic exceeds the upper bounds, one may reject the hypotheses of no long run relationship. However, if the *F*-statistic falls between these two bounds, inference would be inconclusive. Moreover, when the order of integration between the variables is known, and if all the variables are *I(1)*, the decision is made based on the upper bound. Similarly, if all the variables are *I(0)*, then the decision is made based on the lower bound.

Then, the long-run relationship is estimated using the selected ARDL model. If variables are co-integrated, the conditional long run model can then be produced from the reduced from solution of Equation 11, when the variables in first difference jointly equal to zero, i.e $\Delta x = \Delta y = \Delta z = 0$. Thus**,**

$$y_t = \partial_\circ + \partial_2 x_t + \partial_3 z_t + v_t ...(12)$$

where $\partial_\circ = -\lambda_1 / \lambda_2$; $\partial_2 = -\lambda_3 / \lambda_2$; $\partial_3 = -\lambda_4 / \lambda_2$, and v_t are the random errors. These long run coefficients are estimated by the ARDL, model

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[9] SBC is known as selecting the smallest lag length to specify a parsimonious model. The mean prediction error of AIC based model is 0.0005 while that of SBC based model is 0.0063 (Min B. Shrestha, 2003).

in Equation-11 by OLS. When there is long relationship between variables, there exists an error correction representation. Therefore, the error correction model is estimated generally as represented in following reduced form equation:

$$\Delta y_t = \sum_{i=1}^{p} \lambda_i \Delta y_{t-1} + \sum_{j=1}^{m} \beta_i \Delta x_{t-j} + \sum_{k=1}^{n} \beta_k \Delta z_{t-k} + \eta ECM_{t-1} + \omega_t ...(13)$$

To ascertain the goodness of fit of the ARDL model, the diagnostic test and the stability test are conducted. The diagnostic test examines the serial correlation, functional form, normality and heteroscedisticity associated with the model. The stability test is conducted by employing the cumulative sum of recursive residuals (**CUSUM**) and the cumulative sum of squares of recursive residuals (**CUSUMsq**). Examining the prediction error of the model, is another way of ascertaining the reliability of the **ARDL** model. If the error or the difference between the real observation and the forecast is infinitesimal, then the model can be regarded as having the best fit.

Interpreting Style

Prior step to inspect the order of integration of individual series; DF-GLS (Dicky-Fuller Generalized Least Square) by Elliot et al, (1996) and Ng-Perron (2001) tests have been employed in the present study. Results of both tests are reported in Table-2 All variables are non-stationary at their levels at the 1st difference, all the said variables are stationary. One may conclude that variables are having *I(1)* order of integration. The results in Table-2 show that all variables are *I(1),* lends support for utilization of the ARDL bounds approach rather than one of the alternative co-integration tests. After finding integration order of all variables, the two-step ARDL co-integration (see Pesaran *et al.*, 2001) procedure is implemented in the estimation of Equation 1 for Pakistan utilizing annual data over the period 1971-2006.

First of all, the order of the lag length in first difference has been estimated with the conditional error correction version of ARDL model for Equation-11. This is usually obtained from unrestricted vector auto-regression (VAR) by means of Schwartz Bayesian Criteria and Akaike Information Criteria, which is 2 based on the minimum value (AIC) as shown in Table-3. In such a small sample of observations, we cannot take leg length more than 2 lag orders. The total number of regressions estimated following ARDL method in Equation No.11 are $(2+1)^6 = 729$.

Table-2: Unit Root Behavior

Variables	DF-GLS	
	At Level	**At 1ˢᵗ Difference**
GDPC	-2.343	-5.549*
CA	-1.456	-3.668**
INF	-2.888	-5.863*
INV	-2.726	-5.275*
EDU	-1.404	-5.028*
MC	-0.946	-3.631**
Ng-Perron Test Statistics			
Variables	At Level			
	MZa	MZt	MSB	MPT
GDPC	-4.874	-1.403	0.288	17.815
CA	-2.904	-1.010	0.347	26.240
INF	-9.989	-2.228	0.223	9.152
INV	-10.445	-2.256	0.216	8.857
EDU	-3.189	-1.165	0.365	26.427
MC	-8.126	-2.014	0.247	11.216
1ˢᵗ Difference				
Variables	MZa	MZt	MSB	MPT
GDPC	-14.684***	-2.681	0.182	6.365
CA	-16.612***	-2.871	0.172	5.545
INF	-17.8862**	-2.990	0.167	5.095
INV	-16.280**	-2.818	0.173	5.801
EDU	-17.200**	-2.920	0.169	5.369
MC	-72.0004*	-5.566	0.077	3.049

Note: * (**) *** representing significant at 1% (5%) 10% level of significance

Table-3: Lag Selection Criteria

Lag Length Selection of VAR Model			
Lags	AIC	SBC	Maximum Likelihood
1	75.5177	77.3841	-1279.561
2	73.9424	77.4441	-1179.022
Short Run Diagnostic Tests			
Serial Correlation LM Test =1.231 (0.311)			
ARCH Test = 0.044 (0.833)			
White Heteroskedasticity Test = 1.193 (0.368)			
Normality J-B Value = 0.351(0.838)			
Ramsey RESET Test = 2.774 (0.110)			

Table-4: ARDL Bound Testing

Dependent Variable			F-Statistic (Wald-Test)	
			Lag Order 2	
GDPC **CA**				
			10.94 (9.33) **9.77**(7.94) **8.51**(6.91)	
INF				
INV			**6.47**(5.26)	
EDU			**73.41**(9.25)	
MC			**3.29**(2.68)*	
Critical Value	**Pesaran et al (2001)** [a]		**Narayan P (2005)** [b]	
	Lower Bound Value	Upper Bound Value	Lower Bound Value	Upper Bound Value
1 % 5 % 10 %	5.15 3.79 3.17	6.36 4.85 4.14	6.140 4.183 3.393	7.607 5.333 4.410

* ARDL estimation shows that there are five Co-integrating Vectors that is strong indication of long run relationship among said variables and Wald-Test estimations are in parentheses.

[a] Critical values are obtained from Pesaran et al (2001), Table CIII (III): Unrestricted Intercept and no Trend.

[b] Critical values are obtained from Narayan (2005), Table CIII (III): Unrestricted Intercept and no Trend, p.1990.

The results of the bounds testing approach for co-integration show that the calculated *F-statistic* is 10.94, which is higher than the upper level of bounds critical values generated by Pesaran et al (2001) and Narayan P (2005). One may conclude that there are five co-integrating vectors, implying that the null hypothesis of no co-integration cannot be accepted. There is indeed a strong and momentous co-integrating relationship among the variables in this model. Having found a long-run relationship, we apply the ARDL method to estimate

the long run and the short run elasticities [see Pesaran and Shin, 1999 and Pesaran *et al*., 2001 and Narayan Perkash (2005) for more details].

Table-5
Long Run Results of Modified ARDL Regression

Dependent Variable = LFDPC						
Variable	Model-1		Model-2		Model-3	
	Co-efficient	Inst-value	Co-efficient	Inst-value	Co-efficient	Inst-value
Constant	2.781	0.0006	6.511	0.0002	5.858	0.0000
LGDPC(-1)	0.596	0.0000	0.479	0.0000	0.491	0.0000
LCA	0.030	0.0509	-0.702	0.0139	-0.558	0.0013
LCA^2	-	-	0.045	0.0105	0.035	0.0005
LINF	-0.063	0.0023	-0.054	0.0041	-0.056	0.0019
LINV	0.263	0.0126	0.380	0.0007	0.364	0.0006
MC	0.096	0.0066	0.102	0.0018	0.097	0.0018
EDU	0.012	0.0175	-0.005	0.5087	-	-
$R^2 = 0.982994$ Durban-Wat = 2.17 F-stat = 269.740			$R^2 = 0.986714$ Durban-Wat = 2.39 F-stat = 286.463		$R^2 = 0.986493$ Durban-Wat = 2.30 F-stat = 340.845	

Long run elasticities show that economic growth is influenced positively almost 60 percent from previous efficient economic policies in the country. Capital account openness is having little but supportive impact on economic growth in a small developing economy like Pakistan. Pakistan is on 89th position in ranking of openness and regional rank is laying 15 of 30 percent, while economy is 58.2 percent free. Investment freedom in Pakistan is 50 percent, trade freedom-53.6 percent, fiscal freedom-82 percent, monetary freedom-72 percent and financial freedom-40 percent; all these components show weak position of economic integration as compared to other economies in the world. Pakistan is a highly indebted country and capital account liberalization is not much fruitful due to political insatiability, prevalence of mostly in country which weakens the coherency of economic policies, trade deficit increasing day by day which depreciate local currency along-with increase in inflation exogenously.

Governments have to borrow to maintain its policies but these installments of loans are eaten up by the repayment of interest on previous debt. Capital account liberalization gives rise to capital inflows is too large for the domestic financial system to absorb safely. As time passed, capital inflows reversed into capital outflows, revealing an impaired financial system. Revenue side of government is low due to high tax evasion while expenditures are high due to large size of government, which generate budget deficit[10]; hence this entire phenomenon lowers economic growth. High inflation is retarding economic growth as indicating by its impact on economic growth. Enhancement in investment activities, improvement, in human capital and efficient financial markets improve economic activity and hence economic growth in a small developing economy like Pakistan. We add squared term of (*LCA*) linear model to confirm impact of capital account liberalization in monotonic phenomenon. The non-linear model suggests U-shaped friendship between capital account openness and economic growth, which indicates that growth, is low at initial levels of capital account openness and vice versa. The long run relationship between capital account openness, and economic growth in a small developing economy like Pakistan is discussed in Table-5. Table-6 analyzes the short-run coefficient estimates obtained from the ECM version of equation-13.

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[10] Size of government means number of heads working in government machinery; large size government means low level of development expenditures and high administrative cost, which increases pressure on [price policy in the country.

26

Table-6
Modified ARDL Short Run Results (2, 1, 1, 2, 2, 1)

Dependent Variable: ΔLGDPC			
Variables	**Co-efficient**	**Std. Error**	**Inst.value***
Constant	-0.0044	0.0085	0.6160
ΔLGDPC(-1)	0.6727	0.1359	0.0000
ΔLCA	0.0208	0.0309	0.5087
ΔLINV	0.6217	0.0899	0.0000
ΔLINF	-0.0370	0.0173	0.0438
ΔLINF(-1)	0.0492	0.0188	0.0152
ΔMC	0.0081	0.0023	0.0019
ΔMC(-1)	-0.0041	0.0047	0.3854
ΔEDU	0.0186	0.0933	0.0575
ECT(-1)	-1.2355	0.2013	0.0000
R-squared = 0.8728			
Adjusted R-squared = 0.8251			
Akaike info criterion = -3.6601			
Schwarz criterion = -3.2111			
Durbin-Watson stat = 1.5616			
F-statistic = 18.298			

The ECM coefficient shows that the speed of adjustment of variables return to equilibrium. It should have a statistically significant coefficient with a negative sign. Bannerjee *et al.* (1993) hold that a highly significant error correction term does prove the existence of stable long run relationship. Indeed, he has argued that testing the significance of CE_{t-1}, is supposed to carry a negative coefficient. It is a relatively more efficient way of establishing co-integration.

The coefficient of *CE*(–1) is equal to (-1.24) for short run model and implies that the deviation from the long-term inequality is corrected by (1.24) percent over each year insignificantly. The lag length of short run model is selected on the basis of Akaike information criteria (AIC). In short run, capital account openness influences economic growth positively but it is not significant. Increase in investment activities boosts economy through employment generation channel. Lag of inflation-differenced term is supportive to economic growth but that effect is captured by expected inflation drastically. Improvements in stock market capitalization and enhancement in human capital lead real economy and hence stimulates the speed of economic growth in a small developing economy like Pakistan.

Short Run Diagnostic Tests

Diagnostic tests for serial correlation, normality, heteroskedasticity, and functional forms are considered, and results are shown in Table-3. These tests show that short-run model passes through all diagnostic tests in the first stage. The results indicate that there is no evidence of serial-correlation and the model passes the test for normality, and proving that the error term is normally distributed. Functional form of model is well specified along with the fact that no white heteroskedasticity exists in the model. Finally, when analyzing the stability of the long-run coefficients together with the short run dynamics, the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMsq) are applied. According to Pesaran and Shin (1999), the stability of the estimated coefficients of the error correction model should also be empirically investigated. A graphical representation of CUSUM and CUSUMsq are shown in Figures 1 and 2 in Appendix-B

Following Bahmani-Oskooee (2004) the null hypothesis (*i.e.* that the regression equation is correctly specified) cannot be rejected if the plot of these statistics remains within the critical bounds of the 5% significance level. As it is clear from Figures 1 and 2, that the plots of both the CUSUM and the CUSUMsq are with in the boundaries and hence these statistics confirm the stability of the long run coefficients of regressors that affect the inequality in the country. The stability of selected ARDL model specification is evaluated using the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMsq) of the recursive residual test for the structural stability (*see* Borensztein *et al.*, 1995). The model appears stable and correctly specified given that neither the CUSUM nor the CUSUMsq test statistics exceed the bounds of at 5 percent level of significance (*see* Figures 1 and 2).

Conclusions and Policy Implications

This paper explores the impact of capital account openness on economic growth in a small developing economy like Pakistan not only in long run but also in short run. To obtain reliable interpretations, we utilize an advanced technique ARDL for long run rapport and ECM for short run dynamics. Our findings suggest that capital account openness promotes economic growth in long run. Monotonic (Non-linear) correlation between the said variables also proves our hypotheses because the shape of Non-Linear relationship looks U-shaped.

Economic growth is also influenced positively through previous economic policies. Inflation retards the economic growth while improvement in investment activities boosts economic activity in the country. Financial sector's development stimulates the economic growth and increase in human capital formation enhances the potential of the country for longer and sustained economic growth.

Study suggests some policy recommendations: First, governments need to pursue sound macroeconomic and trade policies to minimize the risks of capital account openness. Second, Pakistan should need to reinforce their own financial systems and managerial infrastructure before opening up their capital accounts. Third, a corporate sector marked by fragile finances and poor governance may systematically abuse the opportunities provided by capital account liberalization.
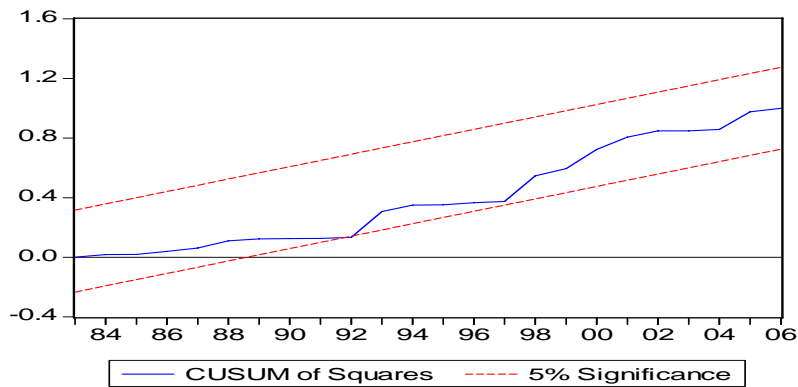
Appendix-B

Figure 1

Plot of Cumulative Sum of Recursive Residuals

The straight lines represent critical bounds at 5% significance level.

29
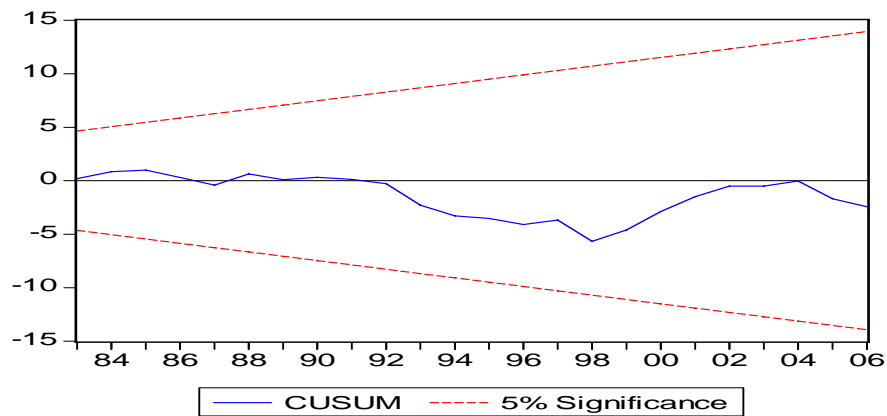
Figure   2
Plot of Cumulative Sum of Squares of Recursive Residuals

The straight lines represent critical bounds at 5% significance level.

Reference

Ahmed, N, (2001), "Trade Liberalization in Bangladesh: An Investigation into Trends", The University Press Limited, Dhaka.

Ariff, Mohamed and Ahmed M. Khalid, (2000), "Liberalization, Growth and Asian Financial Crisis: Lessons for Developing and Transitional Economies, Edward Elgar publishing co., London, May, pp: 544.

Banerjee, A. and A. Newman (1993), "Occupational Choice and the Process of Development", Journal of Political Economy 101(21).

Borensztein, E., De Gregorio, J., J.W. Lee, (1998), "How Does Foreign Investment Affect Growth? Journal of International Economics, 45.pp.115135.

Butkiewicz,-James-L; Yanikkaya,-Halit (2003), "Capital Account Openness, International Trade, and Economic Growth: A Cross-Country Empirical Investigation." University of Delaware, Department of Economics, Working Papers: 03-06.

Carlos et al (2001), "When does capital account liberalization help more then hurts?" NBER working paper series. Working paper 8414.

Chang, R., L. Kaltani and N. Loayza, (2005), "Openness can be Good for Growth: The Role of Policy Complementarities", World Bank Policy Research Working Paper No. 3763, the World Bank, Washington, DC.

Daseking, Christina, Atish Ghosh, Timothy Lane, and Alun Thomas, (2004), 'Lessons from the Crisis in Argentina', Occasional Paper 236, IMF, Washington D.C.

Dejong, D.N., Nankervis, J.C., Savin, N.E., (1992), "Integration Versus Trend Stationarity in Time Series", Econometrica, 60, 423-33.

Dickey, D., Fuller, W.A., (1979), "Distribution of the Estimates for Autoregressive Time Series with Unit Root", Journal of the American Statistical Association, 74 (June), 427-31.

Dollar, D. and A. Kraay (2004), "Trade, Growth, and Poverty," The Economic Journal, 114 (493): F22-F49

Edison, H. J., M. W. Klein, L. Ricci and T. Sløk, (2002), "Capital Account Liberalization and Economic Performance: Survey and Synthesis", NBER Working Paper No. 9100, Cambridge, MA.

Edison, H. J., R. Levine, L. Ricci and T. Sløk, (2002), "International Financial Integration and Economic Growth," Journal of International Monetary and Finance, 21: 749-776.

Edison, Hali; Klein, Michael; Ricci, Luca and Sloek, Torsten, (2002), "Capital Account Liberalization and Economic Performance: Survey and Synthesis." N B E R Working Paper No. 9100.

Edwards, S, (1998), "Openness, Productivity and Growth: What do We Really Know?" Economic Journal, 108: 383-398.

Edwards, S, (2001), "Capital Mobility and Economic Performance: Are Emerging Economies Different? NBER, Working Paper No. 8076, Cambridge, MA.

Elliot, G., Rothenberg, T.J., Stock, J.H., (1996),"Efficient Tests for an Autoregressive Unit Root", Econometrica, 64, 813-36.

Grilli, Vittorio and Gian Maria Milesi-Ferretti, (1995), "Economic Effects and Structural Determinants of Capital Controls", IMF Staff Papers, 42 (3): 517-551.

Hali J. Edison (2004), "Capital Account Liberalization and Economic Performance: Survey and Synthesis," IMF Staff Papers Vol. 51, No. 2 2004 International Monetary Fund.

Hali j. Edison, (2004), "Capital Account Liberalization and Economic Performance: Survey and Synthesis," IMF Staff Papers Vol. 51, No.2, International Monetary Fund.

Harris, R., Sollis, R., (2003), "Applied Time Series Modeling and Forecasting" Wiley, West Sussex.

Hauskrecht, A. and Nhan Le, (2005), "Capital Account Liberalization for a Small Economy", Open Economy, forthcoming.

Henry, P. B. (2000), "Do Stock Market Liberalizations Cause Investment Booms?" Journal of Financial Economics, 58 (1-2), pp. 301-334.

Khalid, A. M. (2004), "Macroeconomic Effects of Financial Liberalization in Pakistan: An Assessment," (unpublished).

Klein, M. W. and G. Olivei, (2000), "Capital Account Liberalization, Financial Depth and Economic Growth," Unpublished, Fletcher School of Law and Diplomacy, Tuft University, Boston, MA.

Kraay, Aart, (1998), "In Search of the Macroeconomic Effects of Capital Account Liberalization," unpublished manuscript, The World Bank (October).

Lieehetta Mirko, (2004), "Macroeconomic Effects of Capital Account Liberalization in Emerging Markets" PhD in Economics Working papers.

Mamun, K. A. and H. K. Nath (2004), "Export-led Growth in Bangladesh: A Time Series Analysis," manuscript, Sam Houston State University.

Min B. Shrestha, (2003), "ARDL Modeling Approach to Co-integration Test".

Mohsen, Bahmani Oskooee, Ng R.. W., (2004). Long Run Demand for Money in Hong Kong: An Application of the ARDL Model. International journal of business and economics, Vol. 1, No. 2, pp. 147155.

Ng, S., Perron, P., (2001), "Lag Length Selection and the Construction of Unit Root Test with Good Size and Power", Econometrica, 69, 1519-54.

Omer, A. (2002), "liberalization and growth an econometric study of Bangladesh", (Hawala). Nairobi: UNDP Somalia.

Paresh Kumar Narayan, (2005), "The saving and investment nexus for China: evidence from co-integration tests", Applied Economics, 37, 1979–1990.

Pesaran and Shin, (1999), "Bounds Testing Approaches to the Analysis of Level Relationships" mimeo.

Pesaran, Shin and Smith, (2001), "Bounds Testing Approaches to the Analysis of Level Relationships" Journal of Applied Econometrics. 16: 289–326.

Phillips, P.C.B., Perron, P., (1988), "Testing for a Unit Root in Time Series Regression", Biometrica, 75, 335-446.

Rashid, M. A, (2000), "Impact of Trade Policy Reforms on Industrial Capacity and Employment in Bangladesh", Structural Adjustment Participatory Review Initiative (SAPRI), Dhaka.

Razin,-Assaf; Rubinstein,-Yona (2006), "Evaluation of Currency Regimes: The Unique Role of Sudden Stops" Economic-Policy January 2006; 0(45): 119-43.

Rodrik, D, (1998), "Who Needs Capital Account Convertibility?" in P. B. Kenen (ed.), Essays in International Finance, 207, May, Department of Economics, Princeton University.

Salinas, G. and A. Aksoy (2006), Growth Before and After Trade Liberalization, World Bank Policy Research Working Paper No. 4062, the World Bank, Washington, DC.

Salinas, G. and A. Aksoy, (2006), "Growth Before and After Trade Liberalization, World Bank Policy Research Working Paper No. 4062, the World Bank, Washington, DC.

Scharfstein, David, and Jeremy Stein, (1990), "Herd Behavior and Investment" American Economic Review, 80, June 1990, pp. 465-479.

Wacziarg, R. and K. H. Welch (2003), Trade Liberalization and Growth: New Evidence,NBER Working Paper No. 10152, National Bureau of Economic Research, Cambridge, MA

Wacziarg, R. and K. H. Welch, (2003), "Trade Liberalization and Growth: New Evidence, NBER Working Paper No. 10152, Cambridge, MA.

Lane P and Milesi-Ferretti G.(2001) "The External Wealth of Nation: Measures of Foreign Assets and Liabilities for Industrial and Developing Countries". Journal of International Economics, 55(2), 263-94.

O' Donnell Barry, (2001), "Financial Openness and Economics Performance" Unpublished, Dudlin, Ireland; Trinity College.