Foreign Aid and Macroeconomic Performance in Pakistan: Exploring the Role of Local Financial Sector Development.

Luqman, Muhammad and Haq, Mairajul and Lal, Irfan

University of Azad Jammu Kashmir, Pakistan, International Islamic University, Islamabad, Institute of Business Management, Karachi, Pakistan

5 December 2013

Foreign Aid and Macroeconomic Performance in Pakistan: Exploring the Role of Local Financial Sector Development

Muhammad Luqman, Mirajul Haq and Irfan Lal[1]

Abstract

It is widely recognized that foreign aid may not be used effectively in recipient countries due to a problem of absorptive capacity. This study assesses the role of such capacity in the effective use of foreign aid in Pakistan. To accomplish this, we incorporate domestic financial sector development in our model. The empirical analysis estimates growth equations using time series data of Pakistan over the period 1972-2011. We construct the index of financial sector development using principal component analysis. The ARDL bound testing approach of co-integration was used for empirical analysis. The empirical evidence substantiates the fact that foreign aid is more effective and consequently enhances both long and short run growth process only in the presence of local financial sector development. For instance, our result revealed that absorptive capacity (i.e. interactive term of local financial sector development and foreign aid) is positive and statistically significant. The findings support the claim that 'local financial sector development plays an important role in the effectiveness of foreign aid'. In addition, the results indicate that foreign aid makes a positive and statistically significant impact on economic growth after allowing nonlinearity between the variables; this, in turn, indicates diminishing return to foreign aid in case of the Pakistan. Our control variables i.e., physical capital and human capital bear their expected positive signs and are also statistically significant. This indicates that physical capital and human capital also play an important role in the log-run economic growth process of Pakistan.

Keywords: *Foreign Aid, Effectiveness, Economic Growth, Human Capital, Co-integration*

JEL Classification: O11, F35, G2, C13, C22

---

[1]The authors are Lecturer, Assistant Professor at the Kashmir Institute of Economics, University of Azad Jammu & Kashmir, Muzaffarabad and Research Fellow at the Institute of Business Management, Karachi, respectively.
Corresponding author's email: luqmanraja@gmail.com

1. Introduction

As world economies are growing more and more interdependent, mutual assistance among them, and its response to economic performance is one of the appealing areas in economic literature. Cooperation in economic sphere to promote economic growth and hence alleviate poverty originates from the aid program known as the Marshall Plan. The main rationale behind the Marshall Program was the reconstruction and restructuring of war-torn economies of Europe after Second World War. After the advent of Marshall Plan, growing body of economic literature sustain that foreign assistance (foreign aid) plays a pivotal role in the growth process and hence poverty alleviation in developing countries. In this connection, Chenery and Strout (1966) put forward the rationale for foreign aid in terms of saving and foreign exchange gaps and argued that it decelerates the growth process in developing countries. They indicated that developing economies could overcome the downbeat impact of dual gaps through external finance. These aid-growth strategies pursued in the developing and underdeveloped economies during the decade of 1960s become the victim of bitter criticism by economists and policy makers on the grounds of income distribution, political motives of aid and its effectiveness. Chenery and Strout (1966) work opened a new avenue for discussion among economists and policy makers. They are not agreeing on the optimistic view that foreign aid is always beneficial for long run economic growth. The major anxiety about foreign aid was its effectiveness and hence repercussions in long run economic growth. Two views prevail among economists about the effectiveness of foreign aid and hence its response to economic growth. But if foreign aid is used in a policy framework aimed at steady long run economic growth then it can fly over the domestic gap and would be economically desirable. On the other hand, if foreign aid is used to maintain the existing status quo, non-development current expenditure (i.e. defense expenditures) and debt servicing then it could be economically inadvisable. To meet these end international donor agencies i.e. International Monetary Fund (IMF) and World Bank (WB) attached different conditions on the provisions of aid. The underlying principle behind aid conditionality is the incentives provided to the recipient countries to adopt those policies, which enhance the productivity as well as probability of obtaining the desired objectives and outcomes.[2]

---

[2]Aid conditionality has been normal practice of bilateral as well as multilateral donors for achieving specific objectives. Since early 1980, when International Monetary Fund and World Bank started to provide loan under Structural Adjustment Program (SAP), conditionality of foreign aid became

The literature on macroeconomic analysis of foreign aid cannot state conclusively that either foreign aid has been beneficial or detrimental to the long run economic growth process of recipient countries. Most of the empirical literature on foreign aid is based on cross-country evidence which often creates more confusion about the net effectiveness of foreign aid. Thus, the question of aid effectiveness remains an issue for analysis of specific countries and specific time periods. In this state of confusion and contradiction, the present study undertakes an in depth empirical analyses of foreign aid and long run economic growth for Pakistan.

Pakistan is one of the largest aid-receiving countries in the world. Because of low level of domestic savings and foreign exchange constraints, Pakistan depends heavily on foreign capital especially foreign aid. Pakistan initiated trade liberalization reforms in mid 1980s and has fully liberalized since mid-1990s and, therefore, opened up new opportunities for trade promotion, economic growth, and poverty alleviation. However, it cannot properly harvest these opportunities as, among other things, its trade balance has deteriorated over time. The one key reason for this is an underdeveloped physical and commercial infrastructure. A large segment of the empirical literature stresses the importance of absorptive capacity (i.e. physical and commercial infrastructure) in gaining from globalization and liberalization. With this in mind, some policy makers justify economic aid for Pakistan. In Pakistan total foreign debt increased from $ 46.16 billion in 2008 to $ 64.04 billion in 2011[3]. In the past forty years (1960-2002) Pakistan has received around US $ 73.14 billion in the form of foreign aid but this aid could not benefit the whole society and has failed to improve the economic conditions in Pakistan (Anwar and Michaelowa, 2006). Social indicators such as education, health, and employment are not encouraging. The overall situation of the economy casts doubt about the effectiveness of foreign aid as a tool for economic growth. Despite the growing concern over effectiveness of foreign aid in Pakistan and its status as one of the largest foreign aid-receiving countries, only few studies have investigated the impact of foreign aid on

criticized on several grounds. In 1998, World Bank published a policy research report entitled Assessing Aid. The empirical part of the report investigated the role of macroeconomic impact of foreign aid on the effectiveness of foreign aid and found that foreign aid helps to spur economic growth but only in countries with good economic policy. Instead of Aid Conditionality, the Assessing Aid Report focuses on selectivity. This report proposes the use of measure of good economic policies and strong institutional environment to select eligible for aid.

[3] Foreign debt shows increasing trend and it grows by 12.7 percent on average during 2007 to 2010.

economic performance of Pakistan.[4] However, there is no study that investigates the role of financial markets in aid-growth relationship in case of Pakistan. The extent to which a country can benefit from foreign aid is believed to be sensitive to the country's financial markets development. This study is an attempt to assess and analyze the role of financial market development in the aid-growth relationship in Pakistan.

2. Review of Literature

Generally, the recent economic literature on foreign aid effectiveness falls into three groups. First, are studies, which are based on strong assumption and argue that foreign aid could assist growth only in conducive policy environment (e.g. Burnsid and Dollar, 2000). Second, some studies suggest that there is nonlinear effect in the aid growth relationship due to diminishing return to aid (Dalgaard and Hansen, 2001; Hansen and Trap (2000a, 2000b); Lensink and White, 2001). Third, some studies on aid effectiveness strongly contradict the first two by suggesting that not only foreign aid has no positive effect on growth but it also hurts economic growth. It expands the public sector, substitute the domestic resource mobilization. It is argued that foreign aid is used to encourage corrupt and inefficient government in developing countries, distort the income distribution in favor of corrupt, and rent seeking segment of country (Griffin and Enos, 1970; Boon, 1996; Weisskoff, 1972; Easterly, 2001; Mosely and Hudson, 1995).

Most recently, different studies investigated the role of structural characteristics such as local financial sector development, political regimes, macroeconomic policy, and political instability of the aid-receiving country in enhancing the positive impact of foreign aid on economic growth. Most of these studies have argued that among structural characteristics local financial sector development plays an imperative role in the effectiveness of foreign aid. The impact of financial sector development on economic growth has been excessively scrutinized both theoretically and empirically. Many of these studies have found positive impact of financial development on economic growth[5]. The main argument supporting the hypothesis is that sound intermediaries in a proper regulatory framework ends up boosting saving and capital accumulation. Capital formation is the one important determinant of

---

[4] Studies found positive impact of foreign aid on economic growth (Shabir and Mahmood, 1992; Mohey-ud-din, 2006), while others argued that foreign aid inversely impacted Pakistan economic growth (Khan and Ahmed, 2007; Ali, 1993; and Khan and Rahim, 1993; Javed and Qayyum, 2011).
[5] Mckinnon (1973) and Shaw (1973), King and Levine (1993), Beck et al., 2000a, Abu-Bader and Abu-Qarn (2008),among others

investment and hence of economic growth. Further financial sector development also improves the efficiency of capital allocation and technological development within the economy[6]. In this association, Nkusu and Sayek (2004) investigated the role of financial sector on aid effectiveness in an integrated framework. Their study found that local financial sector development enhances the positive effect of foreign aid on economic growth and helps poor countries to achieve their development goals. Ang (2009) has assessed the role of financial deregulation and liberalization on aid effectiveness in India and found that foreign aid exerted the negative impact on economic growth in India. However, financial liberalization mitigates these negative effects by increasing the efficiency and absorptive capacity of the economy. Elbadawi et al (2008) found that local financial sector development mitigates the negative impact of foreign aid by protecting the traded goods sector, and it also increases the absorptive capacity of economy. Mundaca (2009) developed a theoretical model of workers' remittances, financial intermediation, and economic growth. He tested his model empirically using data from Latin America and Caribbean countries. He argued that local financial sector development enhances the positive impact of foreign remittances on economic growth.

Macroeconomic impact of foreign aid is also controversial in case of Pakistan. A few studies found positive impact of foreign aid on economic growth in case of Pakistan (Shabir and Mahmood, 1992; Mohey-ud-din, 2006).Some studies found that foreign aid inversely affected the economic growth (Ali, 1993; Khan and Rahim, 1993; Ishfaq and Ahmed, 2005; Khan and Ahmed, 2007). Javed and Qayyum (2011) have investigated the role of macroeconomic policy in aid effectiveness in case of Pakistan. They constructed the policy index using inflation, budget deficit and trade openness as important indicators of macroeconomic policy. Their study found that foreign aid could work but only in a favorable policy environment. Shirazi et. al. (2009) have investigated the impact of foreign aid on the Human Development Index in case of Pakistan. They found that proper management of foreign aid would contribute to human development in Pakistan. However, there is no study that investigates the role of financial markets in aid-growth relationship in the case of Pakistan.

---

[6] After the recent financial crises, there is growing consensus among the policy makers, researchers, and economists that financial capitalism without regulatory framework, can crowd out the private investment and thus economic growth.

3. Model Specification, Methodology and Data

Following Mankiw et al. (1992), this study builds on the model of growth that includes human capital as well as physical capital in the spirit of the Solow model. The model assumes Cobb-Douglas production function. This makes the model tractable and lead easily to quantities analysis. A further advantage of Cob-Douglas assumption is that it appears to be reasonable approximation of actual production function. Hence incorporating human capital in production function takes the following form:

$$Y = (AL)^{\alpha} K^{\flat} H^{y} \qquad\qquad (1)$$

Apart from conventional factors of production, we also want to analyze the impact of foreign aid in the process of economic growth. Therefore, the human capital augmented production function is extended further by incorporating foreign aid as foreign capital.[7] By incorporating foreign aid (foreign capital) the production function, extend as follows:

$$Y = (AL)^{\alpha} K^{\flat} H^{y} F^{8} \qquad \text{Where F is foreign caeital (foreign aid) (2)}$$

Foreign Aid inflows can put upward pressure on the real exchange rate and reduce the competitiveness of the traded goods sector, particularly exports. To mitigate these adverse effects, when monetary and exchange rate policies are carried out in shallow domestic financial markets then level and volatility of interest rate increases, which automatically crowds out private investment and hence retards economic growth.

Deeper financial markets and greater financial absorptive capacity allow monetary and exchange rate management authorities to mitigate the negative impact of aid flows, thereby increasing the gain associated with donor support. Deeper financial markets can play an important role in curbing the possible crowding out effect of Foreign Aid on private investment that is exerted through high and volatile interest rate (Nkusu and Sayek, 2004).

Following Nkusu and Sayek (2004), Elbadawi et al (2008) and Ang (2009), we include financial development in the model through an interactive term.

---

[7] Following Khan (2007), Burke et. al. (2006), Ahmed, and Hamdani (2003) we have used foreign aid as proxy for foreign capital.

3.1 Empirical Model

To analyze the contribution of financial market in the processes of economic growth through foreign aid, the following baseline model is estimated using time series data of Pakistan spanning between 1972 and 2011.

$$LnY_t = b_o + b_1 LnX_t + b_2 Ln(A_y)_t + b_3 Ln(Ay \times FD)_t + s_t \qquad (3)$$

Where

Y= Real GDP

(Ay*FD) = Interactive term of financial development and foreign aid

Ay = Foreign aid to GDP ratio

X= Vector of control variables that includes, gross fixed capital formation, human capital and financial development.

s = Error term.

3.2 Empirical Methodology

This study is based on annual time series data of Pakistan for the 1972-2011 period. As all the variables are time series, each variable could be stationary I (0) or non-stationary I (1) and I (2). If all the variables involved in the study are integrated order one I (1) then we can use Johansen maximum likelihood procedure proposed by Johansen (1988) and Johansen and Juselius (1990). If some variables are stationary at level I (0) and some are integrated of order I(1) then Auto Regressive Distributed Lag (ARDL) is a suitable estimation technique which is also known as bound testing approach and was introduced by Pesaran et. al. (2001).

If after testing, the variables are found to be non-stationary, then next step would be the investigation of long run and short run relationship between the variables. For this purpose we can used the co-integration technique. As all the variables under study are not stationary at level, the Auto Regressive Distributed Lag (ARDL) (Pesaran et. al., 2001) is a suitable estimation technique. This technique is preferred to other conventional co-integration approaches because it can be applied irrespective of order of integration and provides reliable results in case of small samples. The ARDL approach assumes all the variables to be endogenous; hence, this approach provides correct and precise estimates of long run parameter and valid inference even in the presence of endogenous explanatory variable. Thus, simultaneity or endogenity is not an issue. Pesaran and Shin (1999) found that in case of small

sample short run ARDL based estimators are super consistent. This approach also involves the short-run dynamics in the estimation of long run parameters.

Therefore, equation under the ARDL approach is as follows:

$$6Y_t = a + \sum_{i=1}^{p} \text{þ}_i 6Y_{t-i} + \sum_{i=0}^{p} \text{ð}_i\, 6Ky_{t-i} + \sum_{i=0}^{p} y_i\, 6H_{t-i} + \sum_{i=0}^{p} h_i\, 6FD_{t-i}$$

$$+ \sum_{i=0}^{p} 5_t\, 6Ay_{t-i} + \sum_{i=0}^{p} q_i 6FD \times Ay_{t-i} + \alpha_1 Y_{t-1} + \alpha_2 Ky_{t-1}$$

$$+ \alpha_3 H_{t-1} + \alpha_4 FD_{t-1} + \alpha_5 Ay_{t-1} + \alpha_6(FD \times Ay)_{t-1}$$

$$+ s_t \tag{4}$$

Where p is the lag length and under Bound testing approach the null hypothesis of no long run relationship between Y_t and its determinants is as follows

$$H_0:\ a_1 = a_2 = a_3 = a_4 = a_5 = a_6 = 0$$

$$H_1:\ a_i\ G\ 0$$

for at least one i, where i = 1, 2, 3, 4, 5, 6

The presence of co-integration can be checked testing the above null and alternative hypothesis by using the F test. If the test statistics exceeds their respective upper critical values then the null hypothesis is rejected and we can conclude that a long run relationship exist (Ang,2010). On the other if the calculated value of F test falls below the lower bound critical value we conclude that there is no long run relationship among the variables. If co integration is established, we can find long run elastiities by normalizing on a_1 as follows.

$$Y_{t-1} = \frac{\alpha_2}{\alpha_1} K_{t-1} + \frac{\alpha_3}{\alpha_1} H_{t-1} + \frac{\alpha_4}{\alpha_1} FD_{t-1} + \frac{\alpha_5}{\alpha_1} Ay_{t-1} + \frac{\alpha_6}{\alpha_1}(FD \times Ay)_{t-1} \tag{5}$$

3.2.1 Short Run Analysis of the Models

The short run dynamics are examined using the error correction mechanism (ECM), which explains changes in the dependent variable in the explanatory variables as well as deviations from the long run relationships between the variables and its determinants. We formulate the error correction equation for our model 1 as follows.

$$\delta Y_t = a + \sum_{i=1}^{p} \beta_i \delta Y_{t-i} + \sum_{i=0}^{p} \eth_i\, \delta K y_{t-i} + \sum_{i=0}^{p} y_i\, \delta H_{t-i} + \sum_{i=0}^{p} h_i\, \delta FD_{t-i}$$

$$+ \sum_{i=0}^{p} 5_t\, \delta Ay_{t-i} + \sum_{i=0}^{p} q_i \delta FD \times Ay_{t-i} + 8EC_{t-1} + v1_t \quad (6)$$

Were O is the difference operator and ECM_{t-1} is an error correction term. The sign of the parameters 0 is expected to be negative.

Whereas EC term is formulated as

$$EC = Y_t - (\frac{a_2}{a_1}K_{t-1} + \frac{a_3}{a_1}H_{t-1} + \frac{a_4}{a_1}FD_{t-1} + \frac{a_5}{a_1}Ay_{t-1} + \frac{a_6}{a_1}FD*Ay_{t-1}) \quad (7)$$

3.3 Construction of Variables and Data Sources

Important variables used in this study include real GDP, Gross Fixed Capital Formation, Secondary School Enrolment, Foreign Assistances, and Financial Development. Data on these variables are collected from the Handbook of Statistics on the Pakistan Economy 2005 and updated with annual reports of State Bank of Pakistan and Government of Pakistan (GOP), Pakistan Economic Survey. The key variable of study is financial development, therefore in order to analyze the impact of financial development on economic growth we developed an index which is briefly discuss as follows.

3.3.1 Financial Development Index

Financial Development is usually defined as a process that marks improvement in quantity, quality and efficiency of financial intermediary services (Abu-Badarand Abu-Qarn, 2009).Financial Development involves many institutions and activities and cannot be measured by a single indicator. Many studies on Pakistan financial sector Ma and Jalil, (2008), Khan et al. (2005) have used different indicators as a proxy for financial development. However, problem arises with this approach is that different indicator have different results. In this study we employ three commonly measure of financial development and construct a composite index using Principal Component analysis to find out the weight of these indicators.

Our first measure of Financial Development is ratio of M2 to nominal GDP. Many studies used M2/GDP as a standard measure of financial development (King and Levin, 1993). The increase in M2/GDP ratio implies

that increases in financial intermediation and financial deepening. It also indicates the increase in private financial savings.

Our second measure of financial development is the ratio of bank credit to private sector to nominal GDP. It is quite possible that increases in private savings due to increase in M2/GDP could not increases the credit facilities to private firms which are eventually responsible for quality and quantity of investment. If the public sector contribution to total credit is larger than private sector it can hurts economic growth by crowding out of private investment. The market friendly approach suggests that role of government is to just minimize the distortions in the markets. Thus, the ratio of private credit to nominal GDP is related to the quality and quantity of private investment and hence economic growth. The ratio of private credit to nominal GDP has been extensively used in literature (King and Levin, 1993; Abu-Bader and Abu-Qarn, 2008; Carranza, et. al, 2010; Khan et. al., 2005; Ma and Jalil, 2008 among the others).

Our third measure of financial development is the ratio of Stock Market Capitalization to nominal GDP. In Pakistan, all studies on the relationship between Financial Sector and economic growth used bank based measures of financial development. But stocks markets are able to offer different kinds of financial services than the banking system and may therefore provide different kinds of imputes to investment and growth than development of the banking sector (Arestis and Demetriades, 1997). Increases in the ratio of stocks market capitalization to nominal GDP improve an economy's ability to mobilize capital and diversify risk.

Thus, we have used the three series namely ratio of M2 to GDP, ratio of private sector credit to GDP and ratio stock market capitalization to GDP for composite index of financial sector development. We have constructed the index by using the Principal Component Analysis. The methodology of Principal Component analysis finds combinations of set of variables that explains most of the variance/covariance of the original variable (Carranza et. al., 2010). This approach is useful to tackle the problems of over-parameterization and multicollinearity. Results of Principal Component Analysis are reported in Table 1

Table 1: Principal Component Analysis

Correlation of Money Supply to GDP (M2Y), Private Sector Credit to GDP (PVTSCY), Stock Market Capitalization (SMCY)		
	Comp 1	**Comp 2**	**Comp3**
Eigen Value	2.183	0.595	0.222
Variance Prop	0.728	0.198	0.074
Cumulative Prop	0.728	0.926	1.000
Eigenvectors		
Variable	**Vector 1**	**Vector 2**	**Vector 3**
M2Y	0.629	0.001	0.777
PVTSCY	0.549	0.706	0.447
SMCY	0.549	0.708	0.444

The results indicate that first principal component explain about the 72.8 percent of variance, the second principal component explain about the 19.8 percent of the variance and third principal component explains about the 7.4 percent of variance. Following Ang (2010), we have used the percentage of variance as the weight to compute the index.

4. Empirical Findings

The empirical analysis is completed in three steps. In the first step, we have checked the time series properties of each variable included in the study. Based on these results we used ARDL bounds test for long run relationship. For short run analyses, we used an Error Correction mechanism.

4.1 Testing Unit Roots

We begin our empirical analyses by checking the time series properties of data. Although the ARDL methodology does not require, pretesting the stationarity of variables included in the study. However, this methodology is applicable if underlying variables are integrated order one or stationary at level. But if any variable is integrated of order two i.e. I(2) than results based on ARDL are spurious. Therefore pretesting of unit roots to determine the order of integration is important. Two standard unit root tests namely the Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) tests used for assessing the order of integration of underlying variables. A summary of these results are reported in Table 2.

<div align="center">**Table 2: ADF, and PP Unit Root Tests Results**</div>

Series	Null Hypothesis: Unit Root			
	ADF		PP	
	Levels	First Difference	Levels	First Difference
Ln RGDP	1.207 (0.83)	4.246 (0.000)	1.207 (0.89)	4.242 (0.009)
KY	4.855 (0.000)	-------	2.344 (0.005)	---------
Ln H	1.477 (0.822)	4.865 (0.000)	1.816 (0.677)	4.912 (0.000)
FD	2.803 (0.06)	4.274 (0.00)	1.886 (0.335)	4.202 (0.00)
Ay	0.637 (0.84))	8.596 (0.000)	2.144 (0.222)	(11.038) (0.000
Ay²	1.460 (0.455)	7.901 (0.000)	2.566 (0.133)	6.015 (0.000)
(FD*Ay)	0.038 (0.956)	2.914 (0.044)	1.524 (0.511)	6.287 (0.000)

p values in parenthesis

The results reported in Table 6.1 indicate that all the variables are of integrated order one or I(1) except the gross fixed capital formation as ratio to nominal GDP which is stationary at level or I(0).These findings allow us to use the ARDL bound testing approach as this technique require the variables to be less than I(2). Moreover if there is mixed order of integration of time series of variable of interest the most appropriate technique for estimation is the ARDL .Results from both Augmented Dicky Fuller and Phillip Pearron test yield the same conclusion. The PP test considers the presence of structural break in the time series.

4.2 Auto Regressive Distributed Lag (ARDL): The Bound Testing Approach

As a first step in ARDL bound testing approach, we have to decide optimal lag length because in this approach the F test is sensitive to the lag length. We have selected two lag on the basis of Akaike information criterion, and Hannan-Quinn information criterion. These results are shown in the Table 3.

Table 3: Selection of Lag Length

Lag	Ln L	LR	FPF	AIC	SC	HQ
0	16.62	NA	1.4209	-0.50	-0.21	-0.39
1	269.67	399.55	3.2214	-11.25	-8.83*	-10.39
2	341.92	87.46*	1.2414*	-12.47*	-7.94	-10.86*

* indicates lag order selected by the criterion.

LR: sequential modified LR, AIC,Akaike information criterion, SC: Schwarz information criterion, FPE: Final prediction error, HQ: Hannan-Quinn information criterion.

In ARDL bound testing approach, after the lag selection, next step is to estimate the unrestricted Error Correction Model which was already specified in the Equation 4. We have estimated the Equation 4 by ordinary least square method. Following the general to specific methodology, we have deleted the insignificant first difference terms from the model. The most parsimonious model is selected by using the general to specific methodology. We have performed the number of diagnostic test such as Langrange Multiplier (LM) test for the autocorrelation, White Heteroscedasticity test for heteroscedasticity, Jarque-Bera for normality and CUSUM and QUSUMQ for structural stability and Ramsey Reset Test for misspecification of the model. The results are reported in the Table 4.

It can be seen from the Table 4 that results obtained from the model passes through the battery of diagnostic tests. Furthermore, the CUSUM and QUSUMQ tests rule out the possibility of structural instability of the estimated models. Figures of CUSUM and QUSUMQ are available in the Appendix-A.

To find co-integration in the Bounds Testing approach we used the Wald-test to compute the F-statistics. In Bounds Testing approach the higher F-statistics is not an appropriate criteria for long run relationship instead we compare F value with lower and upper bound critical value calculated by Pesaran et al. (2001). If the value of F test falls above the upper- bound critical value than it proved that variables are co integrated (see Table 4).

Table 4: Results of Unrestricted Error Correction Model of ARDL

Variables	Coefficients
Intercept	-0.6969
	(0.070)
$b\ln(RGDP)_{t-1}$	0.3028
	(0.048)
$b\ln(H)_{t-1}$	0.1742
	(0.010)
$b(FD)_t$	0.3225
	(0.012)
$b(FD)_{t-1}$	-0.3422
	(0.008)
$b\ln(Ay)_t$	-0.8290
	(0.005)
$b\ln(Ay)_{t-1}$	-0.4151
	(0.000)
$b\ln(FD*A)_{t-1}$	0.0750
	(0.000)
$\ln(RGDP)_{t-1}$	0.0750
	(0.031)
$\ln(Ky)_{t-1}$	-0.4029
	(0.006)
$\ln(H)_{t-1}$	-0.0869
	(0.001)
$(FD)_{t-1}$	0.0909
	(0.002)
$\ln(Ay)_{t-1}$	0.0505
	(0.1818)
$\ln(A^2y)_{t-1}$	-0.0190
	(0.0912)
$\ln(FD*A)_{t-1}$	-0.0514
	(0.0651)
R-Square	0.796
Adjusted R-Square	0.651
DW-Test	2.0237
Serial Correlation LM test	3.71
	(0.1565)
Jarque –Bera Test	1.9235
	(0.3822)
White Heteroskedasticity	28.915
	(0.522)
Ramsey Reset Test	0.6841
	(0.4179)
F-Statistic	5.482
	(0.0002)

Note: P values in parenthesis

<div align="center">Table 5: Bounds Testing Approach of Co-Integration</div>

Model	Specification	Lower Bound	Upper-Bound	F-statistic	Decision
1	(RGDP/Ky,H,FD,Ay,A^{2}y,Ay*FD)	2.27	3.28	6.46	Co integration

Above table shows that for both specifications the Bounds test reject the null hypothesis of No co integration because the computed F-statistic through Wald test is higher than upper bounds critical value. After finding the evidence of long run relationship between the variables specified in equations, we have estimated the long run and short run elasticity by using Autoregressive Distributed Lag (ARDL) approach.

4.3 Long-Run Parameters of Model

After finding the evidence of long-run relationship between the real GDP and its determinants, we normalized the coefficient of lag level variables by dividing with the coefficient of RGDP and assuming all other first difference variables are equal to zero. The expected sign of the gross fixed capital formation to GDP ratio is positive. Gross enrollment, which is proxy for the human capital, is also expected to exert a positive impact on the economic growth. The priori sign of financial development, foreign aid and interactive term of financial development and foreign aid is ambiguous. The long run estimates of the parameters are reported in the following equation.

$$\ln RGDP_t = 5.36 Ky_t + 1.15 \ln H_t - 1.2 FD_t - 0.67 Ay_t + 0.25 Ay^2_t + 0.68 (Ay \times FD)_t \qquad (8)$$

Above results indicate that most of the variables are significant showing that the variables included in the model have significant long run impact on economic growth in case of Pakistan. The ratio of gross fixed capital formation to nominal GDP included in the long run equation is significant at one percent level of significance with the expected positive sign. This finding is consistent with existing literature on economic growth which emphasizes capital deepening. Secondary school Enrolment, which is proxy of human capital, is also positively and significantly affected the economic growth in case of Pakistan.

Surprisingly, the composite index of financial development is also significant with a negative sign. This result is in sharp contrast with thesis of Mcknnon (1973) and Shaw (1973) Which argued that financial deepening enhance the economic growth. This study is also in sharp contrast to the

earlier findings of Ma and Jalil (2008), Khan et. al. (2005) who demonstrate that financial development positively affects economic growth in case of Pakistan. However, there are many justifications for this unexpected result. Firstly, most of the previous studies used different individual indicators of financial development instead of index. This study constructed the composite index of financial development, which might be the cause of contradictory results. Secondly, owing to the nationalization of banks in 1974, the allocation of credit to the private sector is inefficient due to political intervention. Thus, the financial sector could not create new sources of funds to assist entrepreneurs, rather it benefited the rent seeming segments of the economy, namely politicians, bureaucrats and feudals. Instead of channeling the funds to the private sector, the inefficient financial sector retarded the economic expansion. This finding is consistent with earlier literature (Khan and Khan, 2007). The ratio of foreign aid to nominal GDP is negative but insignificant. Our result does not provide any support for the argument that aid promotes economic growth. This result instead supports the hypothesis that foreign aid has been misused and misallocated and benefited the rent seeking segments of economy. This finding is consistent with the earlier studies on Pakistan (Khan and Ahmed, 2007; Javed and Qayyume, 2011). However the square of aid to nominal GDP is positive and significant which confirms the hypothesis of nonlinear relationship between aid and economic growth due to diminishing return to the aid. This finding is also consistent with earlier literature on effectiveness of foreign aid (Lensink and White, 2001; Hansen and Trap, 2001; Dalgraard and Hansen, 2001; Dalgaard et al., 2004). However, the interactive term of financial development and foreign aid is positively significant. Therefore it can be deduced that financial sector development enhance the positive impact of foreign aid on economic growth by increasing the absorptive capacity of domestic economy .This finding is consistent with earlier cross country study (Nkusu and Sayek, 2004) and country specific study of India (Ang, 2010) .

4.4   Short Run Dynamics of Model

After estimating the long run relationships, we estimated error correction model to examine the short run dynamics. The error correction term (ECM) consists of residual obtained from the long run coefficients. The most parsimonious model is selected by deleting the insignificant variables. In this way, we followed the general to specific methodology. We also applied the different diagnostic test to check the validity of the model. Figures of

CUSUM and QUSUMQ are available in the Appendix-B. The short run results are reported in the Table 6

Table 6: Short Run Dynamics: An Error Correction Model

	Dependent Variable: ln RGDP		
Variables	**Coefficients**	**T - Statistics**	**P value**
Constant	-0.140	-2.86	0.008
OKy	0.522	3.16	0.003
OlnH$_{t-1}$	0.132	2.94	0.006
OFD$_{t-1}$	1.764	-3.43	0.001
OlnAy$_{t-1}$	-0.542	-3.00	0.005
OlnA^{2}y$_{t-1}$	-0.256	2.38	0.021
OlnA^{2}y$_{t-2}$	0.172	3.72	0.001
Oln(A*FD)$_{t-1}$	0.509	-4.46	0.000
EC$_{t-1}$	-0.002	-4.03	0.000
R^2	0.75		
Adjusted R^2	0.66		
DW-Stat	1.98		
F-statistics	8.89		
	(0.000)		
White Heteroscedasticity Test	16.06		
	(0.59)		
Serial Correlation LM test	3.58		
	(0.167)		

Above results shows that physical capital as well as human capital are positively related to economic growth and highly significant in case of Pakistan. These results are consistent with earlier literature on economic growth which emphasizes on the importance of physical capital as well as human capital. Financial development is positive and significant at a one percent level of significance, which means financial sector is also an important determinant of economic growth in short run. This finding support the argument that money supply is positively related with output in short run. Likewise, long run foreign aid is negative and highly significant also in short run. The square of aid is negative in the first lag but positive in the second lag. Both lags variables are highly significant in short run. This finding also supports the argument that there are decreasing returns to foreign aid. The Interactive term of financial development and foreign aid is positive as well as significant in short run. This finding supports the argument that developed local financial system enhances the positive relationship between foreign aid and economic growth. The error correction term (EC$_{t-1}$) is highly significant and negative which shows that there is convergence in the model in case of

shocks and it also supports the hypothesis that there is a long run relationship between the variables under investigation.

5. Conclusions and Policy Implications

The primary objective of this research exercise was to determine, whether or not foreign aid contributes to economic growth in Pakistan. To assess the role of absorption capacity, domestic financial sector development was incorporated into the model. Hence, in this model, economic growth was associated with foreign aid, financial sector development, human capital, and physical capital. The empirical analysis estimates growth equations using a time series approach for Pakistan over the period 1972-2011. The financial sector development index was constructed through Principal Component Analysis. The ARDL bound testing approach of co -integration was used for empirical analysis. The overall evidence substantiates the fact that foreign aid is more effective, and consequently enhances both long and short run growth process, only in the presence of local financial sector development. For instance, our result revealed that absorptive capacity (i.e. interactive term of local financial sector development and foreign aid) exhibits a statistically significant and positive sign. This findings support the claim that 'local financial sector development plays an important role in the effectiveness of foreign aid'. Hence, it can be safely concluded that Pakistan can harvest the benefits of foreign aid, in the form of sustainable long run economic growth, only with the development of local financial sector. Nonlinearity between foreign aid and economic growth also bears a significant and positive sign, which indicates diminishing return to foreign aid in case of Pakistan. Our control variables i.e. physical capital and human capital bears their expected positive signs, which are both statistically significant. This indicates that both physical capital and human capital plays an important role in the log-run economic growth process of Pakistan.

There are some of the facts that can direct policy formulation. First, our empirical findings provide support to the claim that 'local financial sector development plays an important role in the effectiveness of foreign aid'. Accordingly, Pakistan needs to develop its local financial sector in order harvest the output of foreign aid in the form of sustainable economic growth.

Second, the findings of the study support the evidence of diminishing return to foreign aid and it recommend Pakistan to minimize reliance on foreign resources. This requires public policy that contributes to the mobilization of domestic resources. Third, policy that encourages both

domestic savings and accumulation of human capital should be emphasized. Our study finds that both physical capital and human capital are the important determinants to explain economic growth in Pakistan.

References

Abu-Bader, S., & Abu-Qarn, A. S. (2008). Financial Development and Economic Growth: Empirical Evidence from Six Mena Countries. *Review of Development Economics*, 12(4): 803-817.

Ahmed., E., & Hamdani, A. (2003). The Role of Foreign Direct Investment in Economic Growth. *Pakistan Economic and Social Review*, 41(1-2): 29-43.

Ahmed, H. (2009). Capital Flows and Real Exchange Rate Overvaluation-A Chronic Ailment: Evidence from Pakistan. *The Lahore Journal of Economics*, 14(2): 51-86.

Ahmed, M. H., & Ahmed, Q. M. (2002). Foreign Capital Inflows and Domestic Savings in Pakistan: Cointegration Technique and Error Correction Modelling. *The Pakistan Development Review*, 41(4): 825-836.

Ahmed, V., & Wahab, A. W. (2011). Foreign Assistance and Economic Growth Evidence from Pakistan. Available online at *http://mpra.ub.uni-muenchen.de/30344/.*

Ali, M., & Nishat, M. (2009). Do Foreign Inflows Benefit Pakistan Poor. *The Pakistan Development Review*, 48(4): 715-738.

Ali, S. S. (1993). Management of Foreign Debt and Dependency in Pakistan. (Unpublished) *M.Phil. Thesis. Department of Economics, Quaid-i-Azam University Islamabad.*

Amavilah, A. V. (1998). German Aid and Trade versus Namibian GDP and Labor Productivity. *Applied Economics*, 30: 689-695.

Ang, J. B. (2009). Does Foreign Aid Promote Growth? Exploring the Role of Financial Liberalization. *Review of Development Economics*, 14(2): 197-212.

Anwar, M., & Michaelowa, K. (2006). The Political Economy of US Aid to Pakistan. *Review of Development Economics,* 10(2): 195-209.

Anwar, M., & Aman, S. (2010). Aid Effectiveness in the Educational Sector of Pakistan. *Pakistan Journal of Social Science*, 30(2): 355-371.

Arestis, P., & Demetriades, P. O. (1997). Financial Development and Economic Growth: Assessing the Evidence. *Economic Journal*, 107(3): 783-799.

Aslam, M. (2011). *Pakistan Economy Retrospect 1947-2010*. Ferozsons (Pvt) Ltd. Lahore.

Bacha, E. L. (1990). A Three-Gap Model of Foreign Transfers and the GDP Growth Rate in Developing Countries. *Journal of Development Economics,* 32: 279-296.

Beck, T., Levine, R., & Loyaza, N. (2000a). Financial Intermediation and Growth: Causality and Causes. *Journal of Monetary Economics*, 46 (2): 31-77.

Boone, P. (1996). Politics and Effectiveness of Foreign Aid. *American Economic Review,* 40(2): 289-329.

Burke, P. J., Fredoun, Z., & Esfahni, A. (2006). Aid and Growth: A Study of South East Asia. *Journal of Asian Economics*, 17(2): 350-362.

Burnside., C., & Dollar. D. (2000). Aid, Policies, and Growth. *American Economic Review,* 90(4): 847-868.

Carrananza, L., Sancher, J. E., & Biscarri, J. G. (2010). Understanding the Relationship between Financial Development and Monetary Policy. *Review of International Economics*, 18(5): 849-864.

Chauvet, L., & Guillaumont, P. (2002). Aid and Growth Revisited: Policy Economic Vulnerability and Political Instability. Paper Presented at Annual Bank Conference, Oslo.

Chenery, H. B., & Strout, A. (1966). Foreign Assistance and Economic Development. *American Economic Review*, 56: 679-733.

Chishti, S., & Hasan, M. A. (1992). Foreign Aid, Defense Expenditures and Public Investment in Pakistan. *The Pakistan Development Review,* 31(4): 895-908.

Dalgaard, C., & Hansen, H. (2001). On Aid Growth and Good Policies. *Journal of Development Studies*, 37(6): 17-41.

Easterly, W. (2001). The Political Economy of Growth without Development: A Case Study of Pakistan. Paper for the Analytical Narratives of Growth Project. Kennedy School of Harvard University.

Easterly, W. (2003). Can Foreign Aid Buy Growth?. *Journal of Economic Perspectives,* 17(3): 23-48.

Elbadawi, I. A., Kaltani. L., & Hebbel, S. (2008). Foreign Aid, the Real Exchange Rate and Economic Growth in the Aftermath of Civil Wars. *The World Bank Economic Review*, 22(1): 133-140.

Faruqui, S. (2007). Pakistan Financial System: The Post Reform Era Manufacturing Stability and Growth. *The Lahore Journal of Economics*, special edition.

Faruqui, S. (2011). Financial System and Economic Development-Pakistan. *Lahore School of Economics*, Volume (II)

Giuliano, P., & Ruiz-Arranz. M. (2009). Remittances, Financial Development and Growth. *Journal of Economic Development*, 90: 144-152.

Griffen, K. B., & Enos. J. L. (1970). Foreign Assistance: Objectives and Consequences. *Economic Development and Cultural Change,* 18(3): 313-327.

Guillaumont, P., & Chauvet, L. (2001). Aid and Performance: A Reassessment. *Journal of Development Studies,* 37(6): 66-87.

Hansen, H., & Tarp, F. (2000a). Aid Effectiveness Disputed. *Journal of International Development*, 12(3): 335-98.

Hansen, H., & Tarp, F. (2000b). Aid and Growth Regression. *Journal of Development Economics*, 64: 547-570.

Hermes, N., & Lensink, R. (2001). Changing the Conditions for Development Aid: A New Paradigm?. *Journal of Development Studies*, 37(6): 1-16.

Hermes, N., & Lensink, R. (2003). Foreign Direct Investment, Financial Development and Economic Growth. *The Journal of Development Studies*, 40(1): 142-163.

Government of Pakistan. (2011). Pakistan Economic Survey 2010-11. Finance Division Economic Advisors Wing, Islamabad, Pakistan.

Government of Pakistan. (2012). Pakistan Economic Survey 2011-12. Finance Division Economic Advisors Wing, Islamabad, Pakistan.

Husain., I. (1999). Pakistan the Economy of an Elitist State. Karachi. Oxford University Press.

Ishfaq, M. (2004). Aid effectiveness, Debt Capacity and Debt Management in the Economy of Pakistan. *A dissertation Submitted for PhD degree to Quad-i-Azam University, Islamabad.*

Ishfaq, M., & Ahmad, E. (2005). Aid Effectiveness: The Case of Pakistan. *The Middle East Business and Economic Review,* 17(2).

Iqbal, Z. (1995). Constraints to the Economics Growth of Pakistan: A Three-Gap Approach. *The Pakistan Development Review,* 34(2): 1119-1133.

Iqbal, Z. (1997). Foreign Aid and the Public Sector: A Model of Fiscal Behavior in Pakistan. *The Pakistan Development Review,* 36(2): 115-129.

Javid, M., & Qayyum, A. (2011). Foreign Aid and Growth Nexus in Pakistan: The Role of Microeconomic Policies. *PIDE Working Papers,* 11-72.

Khan, A. H., Hasan. L., & Malik, A. (1992). Dependency Ratio, Foreign Capital inflows and Rate of Savings in Pakistan. *The Pakistan Development Review*, 31(4): 843-856.

Khan, M. A., & Ahmed, E. (2007). Foreign Aid Blessing or Curse: Evidence from Pakistan. *The Pakistan Development Review*, 46(3): 215-240.

Khan, M. A., & Khan. S. (2007). Financial Sector Restructuring in Pakistan. *The Lahore Journal of Economics*, special edition.

Khan, M. A. (2007). Foreign Direct Investment and Economic Growth: The Role of Domestic Financial Sector. *PIDE Working Paper,* 07-18.

Khan, M. A., Qayyum.A., & Sheikh. S. A. (2005). Financial development and Economic Growth: The Case of Pakistan. *Pakistan Development Review*, 44(4): 819-837.

Khan, N. Z., & Ali. K. (1994). Foreign Aid and Human Resource Development: The Case of Pakistan (1960 to1988). *Pakistan Economic and Social Review*, 32(2): 135-157.

Khan, N. Z., & Rahim, E. (1993). Foreign Aid, Domestic Savings and Economic Growth in Pakistan. *The Pakistan Development Review,* 32(4): 1157-1167.

Khan,S., & Khan, A. (2007). What Determines Private Investment: The Case of Pakistan. *PIDE working paper, 2007:36.*

King, R. G., & Levine, R. (1993). Finance and Growth: Schumpeter Might Be Right. *Quarterly Journal of Economics*, 108: 717-737.

Lensink, R., & White, H. (2001). Are There is Negative Return to Aid?. *Journal of Development Studies*, 37(6): 42-65.

Lensink, R., & White, H. (2000). Assessing Aid: A Manifesto for Aid in 21st Century. *Oxford Development Studies,* 28(1).

Lucas, R. E. (1988). On the Mechanics of Economic Development. *Journal of Monetary Economics,* 3-42.

Ma, Y., & Jalil, A. (2008). Financial Development, Economic Growth and Adaptive Efficiency: Comparison between China and Pakistan. *China and World Economy,* 16(6): 97-111.

Mahmood, A. (1997). The Role of Foreign Aid in Economic Development of Pakistan (1960 to1995). *Pakistan Economic and Social Review,* 35(1): 57-90.

Mankiw, N. G., Romer, D., & Weil, D. N. (1992). A Contribution to the Empirics of Economic Growth. *Quarterly Journal of Economics*, 107(5): 407-437.

McGillivray, M. (2009). Aid, Economic Reform, and Public Sector Fiscal Behavior in Developing Countries. *Review of Development Economics*, 13(3): 526-542.

McKinnon, R. (1973). Money and Capital in Economic Development, Washington, DC: Brookings Institution.

Mohey-ud-din, G. (2006). Impact of Foreign Capital Inflows on Economic Growth in Pakistan [1975-2004]. Available online at http://mpra.ub.uni-muenchen.de/1233/

Mosley, P., & Hudson, J. (1995). Aid Effectiveness: A Study of the Effectiveness of Overseas Aid in the Main Countries Receiving ODA Assistance. University of Reading and University of Bath.

Munemo, J. (2011). Foreign Aid and Export Diversification in Developing Countreis. *The Journal of International Trade and Economic Development*, 20(3): 335-339.

Mundaca, G. (2009). Remittances, financial market development, and economic growth: the case of Latin America and the Caribbean. *Review of Development Economics*, 13(2): 288-303.

Nkusu, M., & Sayek, S. (2004). Local Financial Development and the Aid–Growth Relationship. *IMF working paper,* 04-238.

Nyoni, T. S. (1998). Foreign Aid and Economic Performance in Tanzania. *World Development,* 26: 235-1240.

Pesaran, M. H., Shin. Y., & Smith, R. J. (2001). Bounds Testing Approaches to the Analysis of Level Relationships. *Journal of Applied Econometrics*, 16: 289-326.

Rajan, R., & Subramanian, A. (2008). Aid and Growth: What does cross country evidence Really Show? *Review of Economics and Statistics,* 90(4): 643-665.

Rajan, R., & Subramanian, A. (2005). What Undermine Aid's Impact on Growth. *IMF Working Paper,* 05-126.

Roemer, M. (1989). Macroeconomics of Counterpart Funds. *World Development,* 17: 795-808.

Romer, D. (1986). Increasing Return and Long Run Economic Growth. *Journal of Political Economy*, 94(5): 1002-1037.

Romer, D. (1990). Endogenous Technical Change. *Journal of Political Economy,* 98(5): 71-102.

Sahoo, P., & Dash, K. D. (2012).Economic Growth in South Asia: Role of Infrastructure. *The Journal of International Trade and Economic Development*, 21(2): 217-252.

Shabbir, T., & Mahmood, A. (1992). The Effect of Foreign Private Investment on Economic Growth in Pakistan. *The Pakistan Development Review*, 31(4): 831-862.

Shaw, E. S. (1973). *Financial Deepening in Economic Development.* New York: Oxford University Press.

Shirazi, N. S., Mannap, T. A. A., & Ali, M. (2009). Effectiveness of Foreign Aid and Human Development. *The Pakistan Development Review*, 48(4): 853-862.

Sing, R. D. (1985). State Intervention, Foreign Economic Aid, Savings and Economic Growth in LDC: Some Recent Evidence. *Kyklos,* 38(2).

Solow, R. M. (1956). A contribution to the Theory of Economic Growth. *Quarterly Journal of Economics,* 70(1): 65-94.

Solow, R. M. (1957). Technical Change and the Aggregate Production Function. *Review of Economics and Statistics,* 312-320.

State Bank of Pakistan. (2005). *Hand Book for the Pakistan Economy. Available online at* www.sbp.org.pk/departments/stats/pakEconomy_HandBook/index.htm

Tadesse, T. (2011). Foreign Aid and Economic Growth in Ethiopia. Available online at http://*mpra.ub.uni-muenchen.de/33953/.*

Tahir, M. (2008). An Investigation of the Effectiveness of Financial Development in Pakistan. *The Lahore Journal of Economics*, 13(2): 27-44.

Tavares, J. (2003). Does Foreign Aid Corrupt?. *Economics Letters,* 79: 99-106.

Weisskoff, T. E. (1972). Econometric Tests of Alternative Constraints on Economic Growth of Underdeveloped Countries. *Review of Economics and Statistics*, 54: 67-78.

Wilder, A. (2010). Aid and Stability in Pakistan: Lessons from the 2005 Earthquake Response. *Disaster*, 34(3): 406-426.

World Bank. (2012). *The Global Development Finance*. Washington D.C: World Bank.

Appendix A

Model: Role of Financial Sector Development in Long Run
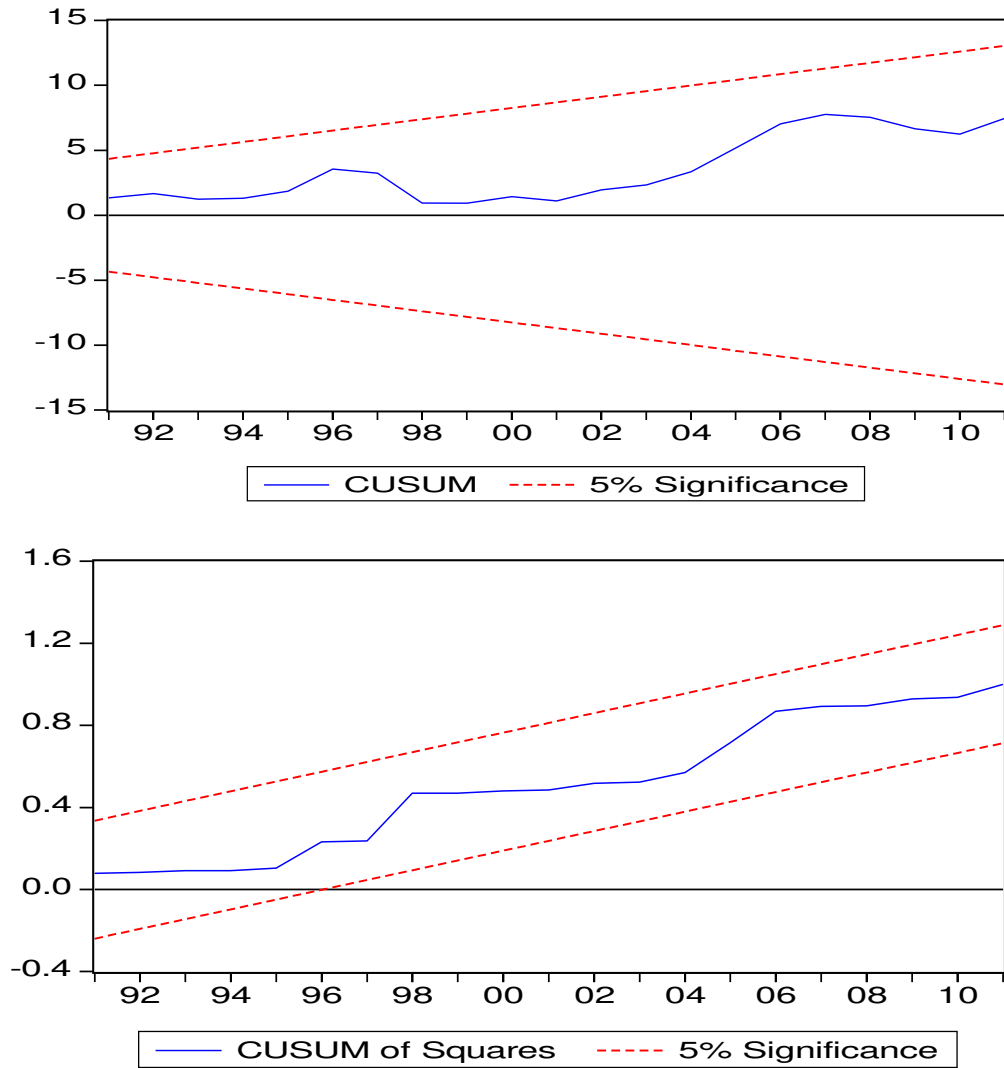
Appendix B

Model: Role of Financial Sector Development in Short Run