

## GLOBALIZATION, TECHNOLOGY TRANSMISSION AND ECONOMIC GROWTH

### **Globalization, technology transmission and economic growth**

(a case study of pakistan)

Bushra Mushtaq

Virtual University of Pakistan

[Bushra.mushtaq@vu.edu.pk](mailto:Bushra.mushtaq@vu.edu.pk)

Muhammad Afzal

University of Punjab

[Mafzal86@gmail.com](mailto:Mafzal86@gmail.com)

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## ABSTRACT

This Research Examines various channels of foreign technology transmission as a result of economic liberalization and their impact on economic growth of Pakistan from 1972 to 2009 by employing bounds testing approach to co integration within an Autoregressive Distributed Lag (ARDL) framework. Foreign direct investment (FDI) and the imports of technology goods (capital and machinery) are direct means of technology diffusion while cross country movement of people and learning by exporting are indirect ways to transfer foreign knowledge (entrepreneurship and management skills, new and modern method of production etc.) and flow of ideas coming from foreign research and development and benefiting the productivity. The result of bounds testing process confirms that there is presence of co integration among the dependent and independent variables. Over the long-run the import of technology goods and exports has positive and significant impact on economic growth of Pakistan, while the long-run impact of foreign direct investment is negative. The movement of people across the country has no significant long-run impact on Economic growth of Pakistan. Pakistan should encourage the import of technology goods (capital, machinery and parts of machinery) along with diversifying the Export base.

Keywords: Technology diffusion, Liberalization, R & D spillovers, Technology imports, FDI.

## INTRODUCTION

How the Economic Growth can be stimulated? This is the question which strikes on every policy maker and economist to find the answer. What factors can affect the economic growth? The answer of this question is unclear so far. After the endogenous growth theory as given by Romer (1986, 1990), Lucas (1988) and Grossman and Helpman (1991) Knowledge is being considered as an important and endogenous determinant of Economic growth. The latest knowledge (Technology) is essential for developing countries to catch-up with developed economies.

Economic liberalization refers to both trade liberalization and financial liberalization. Trade liberalization means reduction in trade restrictions like tariff, quota or other trade barriers which discourage the international trade. On the other hand more capital inflow outflow as a result of either FDI, portfolio investment or worker remittances shows the country is financially integrating with rest of the world. How the economic liberalization affect the Economy of any particular country. The issue whether the economic liberalization is good or bad for developing country has become a huge policy debate.

It is true that almost all developing economies face the scarcity of technology. Technology is very essential to enhance the productivity of factor of production and alternatively for economic growth. This is because the developing countries spend less on research and development while developed countries heavily spend on R & D so high concentration of technology is in the hand of developed countries. According to the Global Competitiveness Report 2011-2012, Pakistan ranks at number 93 in term of Availability of latest technology index while India ranks at 47, Turkey 52 and Sri Lanka 63. These figures clearly show that our weak R&D base as compared to countries of even our region. So dependence on foreign source of Technology is very crucial and important for Pakistan. World Economic forum ranked all the countries to see at what extent business in your country can absorb new technology. According to report (2011-12) Pakistan's rank is 92 while India's rank is 41, Sri Lanka's 42 and Turkey has rank of 44. Another index to see at what extent does FDI brings new technology into your country, Pakistan's rank is 121, India's 38 and Sri Lanka's 45.

There are many channels through which Technology can be transferred from developed countries. The direct import of Technology embodied machinery and intermediate goods is one channel of transmission of Technology. Foreign direct investment by multinational companies (MNCs) is another source of international Technology transmission. The MNCs import not only Technological modern machinery but also the Ideas and

knowledge generated through R & D carried out in parent country. In addition there is movement of employees or managerial talent from developed economies to low and middle income economies when these countries open their economies.

To absorb the foreign technology brought by foreign investor, the absorption capacity of host country matters. Most of studies use level of human capital as measure of absorption capacity<sup>1</sup>. As without minimum level of skill or knowledge (absorptive capacity) the local firms cannot get knowledge benefit of technology transmission through foreign direct investment (UNCTAD, 2010).<sup>2</sup>

Many studies have shown that foreign sources of Technology are important contributor to productivity growth for the developed economies. Less developed economies as they spend less on R & D and face scarcity of modern Technology. The import of Technology or transmission of Technology from developed countries is key question for their economic growth. There is lot of controversy regarding the Technology transmission whether it is good or bad for developing countries. Some Economist argues that more open economies have more ability to absorb technology generated in advanced countries. Some economist like Coe and Helpman(1995) showed that transmission of technology and related knowledge from developed countries to developing countries through export and import will be more effective in economies with better and advanced education.

Several economists favor the hypothesis of “learning by exporting”. There is lot of literature which shows that exporters are more productive on average as compared to non-exporters<sup>3</sup>.

Trade and investment policies of Pakistan are fairly liberal since late 80s the average tariff rate come down to just 20 percent in 2001-02 which is only a half as compared to the mid-1990s. In the foreign investment policy 1997 Pakistan has opened most of sectors of economy to FDI, by giving 100 percent foreign ownership except some conditionality like the provision of national treatment to foreign companies by following the WTO obligations by giving some incentives such as duty and tax exemptions and some other concessions. Pakistan has taken many steps for inward FDI but is not able to attract large FDI. FDI is very important for Pakistan but it has played a small role in Pakistan economy. In most of year the ratio of FDI to GDP is less than 1 percent. After independence FDI was very crucial for the success of both import substitution and infant industry.

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<sup>1</sup>Nelson and Phelps (1966), Benhabib and Spiegel (1994).

<sup>2</sup>United Nation Conference on Trade and Development, 2010.

<sup>3</sup>(Bernard and Jensen 1999)

Pakistan is one of those countries which allocate very minor amount on R & D and faces scarcity of Technology, so foreign sources of technology are very important for Pakistan. Main focus of this study will be to examine the long-run and short-run impact of Technology (knowledge) transmission on Economic growth of Pakistan by using bounds testing approach to co integration within an Autoregressive Distributed Lag (ARDL)<sup>4</sup> and thereby the importance of several channels of Economic liberalization like the direct import of technological machinery and intermediate goods, export of goods and services and transformation of modern technology, ideas, knowledge and managerial talent from developed economies through MNCs for Economic growth of Pakistan.

The outline of this research is as follows. The next chapter provides the comprehensive review of the literature. The third chapter presents the empirical analysis which includes model specification, Econometric specification result discussion and Sensitivity Analysis. The fourth and final chapter provides the conclusion and policy recommendation.

### OBJECTIVES OF THE STUDY

- To identify the different channels of foreign technology.
- To examine the impact of different channels of technology transformation on economic growth of Pakistan through long-run and short-run empirical investigation.
- To give the policy options to promote Technology Transformation and effectively use this technology by developing absorption capacities of Pakistan.

### REVIEW OF THE LITERATURE

Caves (1974) are of the view that there may be two different impacts of foreign knowledge spillovers that are competitive effect and technology diffusion effect. The result of this study confirm that in industry where the proportion of output produced by foreign owned firms is higher, the domestic owned firms have higher value added per worker. This supports the view that firms take benefit of foreign knowledge or technology and this increases the efficiency of domestic owned firms.

Barro (1991) examined the relationship between exports and economic growth by using the data of Middle East and African countries. The simple ordinary least square regression was

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<sup>4</sup>Pesaran et al, (2001)

used. The results show that there is positive and significant correlation between exports and economic growth. The major shortcoming of this study is that this did not show the direction of relationship i.e. either relation is from export to growth or from growth to exports.

Eaton and Kortum (1996) have showed that international licensing agreements as a direct way to transfer foreign technology but according to world investment report 2000, technology transfer through this source is not important because it does not contain modern technology.

XU and Wang (2000) examined the impact of Trade and Foreign direct investment as channels for technology transmission from industrialized countries to less developed countries. They also checked impact of this technology on TFP of these countries. The sample of 21 OECD<sup>5</sup> countries for the period from 1971 – 1990 was used. Three channels, capital goods trade, inward FDI and out ward FDI were considered for technology transmission. Ordinary least squares with white's hetero scedasticity consistent covariance estimation method were used to the Cobb-Douglas production function to estimate the required results. The results showed that the technology which comes through the imports of capital goods had a sizeable positive effect on a country's total factor productivity. That is strong empirical support for the trade as channel of foreign technology diffusion. To examine the role of FDI a sample of 13 OECD countries for the period of 1983-90 was used. The results showed the outward FDI brings technology back to the home country through the multinational enterprises. There were some short comings in this study. For example Cobb-Douglas production function does not take into account the endogeneity problem in the variable. There is need to develop theoretical justification for methods used and also more attention should be paid to econometric issues.

Beine, et al (2001) has examined the impact of migration on Human capital and Economic growth by using the data of 37 small opened developing economies. The analysis was done by making assumption that people take education decisions in uncertain environment regarding the future migration. There are two growth effects, ex ant "brain effect" and ex post "drain effect". By studying the literature two type of relationship were established, first is the share of educated people effect positively to the economic growth and share of migrated people have negative impact on economic growth. Two type of finding were found first is that migration opportunities give incentive to spend more for education because of high expected wages abroad as compared to home. This is brain effect and second is drain effect

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<sup>5</sup> "Organization for Economic Co-operation and Development"

which depend on many things so its impact is not clear. The policy implication is that government should have appropriate pricing policy i.e. tax and subsidies to retain skilled labor force at home.

Chakraborty and Basu (2002) examined the causality from GDP to FDI in Indian economy by using co-integration and error-correction models. Results showed that causality run from GDP to FDI rather from FDI to GDP in the Indian economy.

Majeen, et al (2001) analyzed the importance of different channels of transformation of technology and its impact on productivity growth of local firms of eight transition countries for the period 1994-1998. This study has employed growth accounting approach to get the required results. In this way, the standard growth accounting approach by Solow (1957) have been used to measure the direct and indirect technology transfer to the transition economies. This approach studies the different factors of production affecting the productivity, like intra-industry knowledge spillovers from FDI and R&D spillovers through trade. In this approach the total productivity can be decomposed into internal and external factors that affect the productivity of firms. The results showed that FDI is the major channel to transfer technology in 5 out of 8 transition economies the results also showed that international trade also acts as channel to transfer foreign technology to the local firms in the Czech Republic, Poland, Romania, and Slovenia. So, for the transition economies, the liberalization policy is vital for the productivity of local firms.

Din, et al (2003) have examined the impact of openness on economic growth of Pakistan by using data form 1960 to 2001. Openness was measured by total export plus imports. Error correction model (ECM) within the frame work of vector auto regression (VAR). The results show that there is no causality between openness and economic growth of Pakistan.

Husain (2005) analyzed the impact of trade liberalization policy on Economic growth of Pakistan for the period from 1972 to 2002. He used the Johansson Co-integration test to check the long run relationship between trade liberalization and Economic growth of Pakistan. The volume of trade i.e. imports plus exports were used as proxy for trade liberalization and other variables are population and investment growth. The stationary of the variables was checked by using ADF<sup>6</sup> test and all the variables were found to be stationary at first difference which gave support to use Johansen Co-integration test to check the long run relationship between trade liberalization and Economic growth. The result showed that trade liberalization has a negative impact on Economic growth in long run, which is 1 percent

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<sup>6</sup>Augmented Dicky-Fuller

increase in trade volume lead to 0.19% decrease in GDP growth of Pakistan. When total trade volume was used separately in total exports and total imports, the positive but insignificant results were found. All this showed that there was no clear cut answers to the question whether trade liberalization positively affect the Economic growth or negatively.

Driffield and Henry (2007) examined the importance of absorptive capacity and institutional quality of host country for making the foreign technology more effective for the economic growth of host country. The absorptive capacity of foreign technology is measured by the level of human capital which is the average level of schooling for the population of 25 years and above. Institutional quality is measured by two ways. First was measured by index of legal structure and property rights and secondly it was measured through quality of bureaucracy. The threshold regression analysis has been used to get the results for the group of 57 developing countries over the period from 1970 to 1998. The results of this study showed that in the case of trade as a channel of foreign technology the institutional quality is more effective for growth effects, while in the case of FDI a channel of foreign technology, the human capital is found to be more effective for economic growth. This means that in the case of FDI, absorptive capacity of host country matters.

Cuaresma and Scharler (2008) investigated the importance of absorptive capacity of foreign technology in effecting the productivity of the host county. A sample of 21 OECD countries was used from 1973 to 1997. There were assumption that there are two major channels of foreign technology i.e. imports of intermediate and capital goods and FDI. Proxies of market regulation and wage bargaining were used to measure the absorption barriers. Foreign R&D stokes were constructed by their import share weighted averages of the country's own R&D stock. The overall results showed that the foreign R&D have positive impact on the economic growth of the countries which have lower levels of market regulation, employment protection and lower barriers to the entrepreneurship.

## EMPIRICAL ANALYSIS

Empirical work is very important in economics. Economists prefer empirical work mainly because of two reasons. Firstly, deep understanding with economic problems can be made by the watchful examination of the data. Secondly, on the basis of empirical findings, existing economic theories can be validated or falsified.

Main focus of this chapter is to empirically examining the significance of transmission of technology as result of liberalizing economy for economic growth of

Pakistan. On the bases of literature and economic theories, the following model will be employed.

$$\ln(Y)_t = f[\ln(K)_t, \ln(L)_t, \ln(\text{TEXP})_t, (\text{MTEC})_t, (\text{FDI})_t, \ln(\text{EMG})_t]$$

or

$$\ln(Y)_t = \beta_0 + \beta_1 \ln(K)_t + \beta_2 \ln(L)_t + \beta_3 (\text{MTEC})_t + \beta_4 (\text{FDI})_t + \beta_5 \ln(\text{TEXP})_t + \beta_6 \ln(\text{EMG})_t + \mu_t$$

TABLE 1

Data and Variable Description

Variable	Description	Source
Y	Gross Domestic products (GDP)	WDI <sup>7</sup>
K	Gross Capital Formation	WDI
L	Employed Labor Force	ILO <sup>8</sup>
MTEC	Technology goods import intensity <sup>9</sup>	Economic Survey of Pakistan
TEXP	Total export	Economic Survey of Pakistan
EMG	Number of emigrants	Bureau of Emigrants & Overseas
FDI	Foreign Direct Investment to GDP ratio	Economic Survey of Pakistan

MTEC<sup>10</sup> is technology goods import intensity defined as imports of Technology goods divided by total import<sup>11</sup>. FDI is the foreign direct investment to GDP ratio is used as other channel of Technology diffusion supported by lot of literature. Data of both the variables MTEC and FDI is taken from Economic Survey of Pakistan. The variables  $\ln(\text{TEXP})_t$  and  $\ln(\text{EMG})_t$  are the natural logarithm of total export and total number of emigrants annually respectively. Both are important indicators of economic liberalization and source of Technology transmission. Data of total exports in million Rupees is taken from Economic Survey of Pakistan and total number of Emigrants annually taken from Bureau of Emigrants & Overseas. Gross Capital formation and employed labor force both are important factor of production which is consistent with the models of Solow (1956), Swan (1956), Kaldor (1961) and Romer (1986, 1989 and 1990). Both are used after taking the natural logarithm ( $\ln K$ ,  $\ln L$ ). Data of Gross capital formation (current US\$) and Gross domestic products (GDP US\$) is taken from world Development Indicator (WDI) and employed labor force taken from International Labor organization (ILO). And at the last  $\mu_t$  is random error term. The natural logarithm is taken to convert the different variable with different units into percentage. MTEC and FDI are already in percentage so these both variables are used

<sup>7</sup> World Development Indicators

<sup>8</sup> International Labor Organization

<sup>9</sup> The Technology goods imports shares is used rather than imports as whole

<sup>10</sup> For detail see Andreas and Marios (2003)

<sup>11</sup> Helpman and Grossman (1991), Wilson and Caselli (2002), and Eaton and Kortum (2001)

without taking natural logarithm. During the year 1971-72 a major change occurred caused by the separation of East wing of Pakistan that's why the data from 1972-2009 have been used for estimation purposes.

## EMPIRICAL FINDINGS AND RESULT DISCUSSION

Augmented Dickey Fuller (ADF) is applied to check the stationary status and the results are given in table 8.

TABLE 2  
Results of Augmented Dickey Fuller (ADF) test

Variables	Test statistics at Level		statistics at 1 <sup>st</sup> difference	
	with intercept	with trend and intercept	with intercept	with trend and intercept
C) ln (MTEC)	-6.47363***	-4.542410		
ln (EMG)	-2.681788	-5.510487	-7.38798***	-8.987188
ln (GDP)	-0.122764	-1.633166	-6.14008***	-6.652551
G) ln (MTEC)	-0.64988***	-4.142916		
ln (EMG)	-1.446830	-2.903182	-6.25059***	-4.525254
ln (GDP)	-1.906312	-3.580459	-1.93909***	-4.386527
ln (MTEC)	-1.299343	-0.677579	-1.25618***	-5.523892

\*\*\* shows significance at 1%, 5% and 10% level of significance.

The results of above table 8 indicate that every variable either is stationary at level or at first difference. MTEC and ln (EMG) variables both are stationary at level because on the basis of t-statistics the null hypothesis of non-Stationarity is rejected at level. Remaining all variables are stationary at first difference because on the basis of t-statistics the null hypothesis of non-Stationarity is rejected at first difference. It is confirmed that no variable has order of integration two or I (2). So it fulfills the assumption of bounds test that no variable is having I (2).

The value of F statistics computed from equation No. 4.4 is given in table 9. The optimal lag length is one selected by using Schwarz Bayesian and Hannan-Quinn information criterion. The values of F statistics are 3.66 reported in table 9 below. As the calculated F statistics is greater than upper bound at 10% and 5% level of significant, so the null hypothesis of no co-integration is rejected. This Bounds Testing results confirm that there is co integration relationship between dependent and independent variables of the model.

TABLE 3  
WALD OR F- STATISTICS FOR TESTING CO-INTEGRATION

Calculated F- statistics	10% level of significance		5% level of significance	
	bound	bound	bound	bound
3.66	2.03	3.13	2.32	3.50

Table 10 shows that import of technology goods (MTEC), exports, employed labor force and gross capital formation have positive and statistically significant impact on GDP in the long run.

TABLE 4

Estimated Long Run Coefficients using the ARDL Approach  
ARDL (1,0,1,1,0,0,1) selected based on Schwarz Bayesian Criterion

Dependent variable is $\ln(Y)$ 38 observations used for estimation from 1972 to 2009				
Variable	Coefficient	Standard Error	t-Statistic	Probability
Constant	7.5033	4.6473	1.6145	[.118]
Exports (EX)	.0079331	.0031764	2.4975*	[.019]
MTEC (M)	.17237	.038716	4.4523*	[.000]
Employed Labor (L)	.64507	.31852	2.0252*	[.053]
GDP (G)	.0015807	.032163	.049145	[.961]
Capital Formation (K)	.16849	.067285	2.5042*	[.019]
Imports (I)	-.065644	.026417	-2.4850*	[.019]

\*Denote the significance of variable at 10% and 5% of level of significant.

The coefficient of export reveals that one percent increase in total exports leads to 0.17 percent increase in GDP growth in the long-run. The positive association between exports and economic growth confirm the export lead growth hypothesis for Pakistan. Export is the important contributor to the economic growth. There are number of benefit of export expansion, like it increases efficiency and improves quality of domestic production. The positive relation between exports and growth is because of the exports sector have positive externalities for non-exporting sector of the country. Expansion production of exportable products can lead to production growth by adoption and transmission of modern method of production. Most of evidences are in the favor that when any country starts exporting, the firms of that country get benefit from interacting with customer of world. These customer demand higher quality products and in this way impose condition to produce higher standard products as compared to domestic customer demand.

The coefficient of MTEC reveals that one percent increase in the technology goods import intensity (MTEC) leads to 0.008 percent increase in GDP growth in the long run. Imports of technological goods (capital, machinery and parts of machinery) have positive and statistically significant impact on economic growth of Pakistan which indicates that to achieve development and to boost economic growth, it is crucial for Pakistan to import technology goods (capital, machinery and parts of machinery) and input material so that the productive capacity can be expanded. The result also confirms that excessive imports of

finished goods (luxury goods) have negative relation with economic growth. This is because the excessive imports of finished (luxury goods) replace the domestic output and thereby the process of value addition in the country. The results are in contrast of the finding of Akbar and Naqvi (2000) who concluded that the imports do not have any role in economic growth of Pakistan but the results of this research show that the imports of technological goods (capital, machinery and parts of machinery) are very crucial for economic growth of Pakistan. The results of this research have also provided the clear cut answer to the study done by Hussain (2005), his study could not give the clear cut answer to the question of whether the trade liberalization positively affects the economic growth or negatively.

The two important growth factors (labor and capital) are the most significant and have positive relation with growth which is consistent with the models of Solow (1956), Swan (1956), Kaldor (1961) and Romer (1986, 1989 and 1990). The coefficient of employed labor (LnL) shows that one percent increase in employed labor leads to 0.64 percent increase in GDP growth and coefficient of gross capital formation (LnK) shows that one percent increase in gross capital formation leads to 0.17 percent increase in GDP growth in the long run. The impact of emigration is not significant although the sign of coefficient of emigration is positive.

On the other hand FDI has significant but negative effect on GDP. The coefficient of FDI shows that one percent increase in FDI leads to 0.06 percent decrease in GDP growth in the long run. The negative relationship between foreign direct investment economic growths indicates the lack of high skilled labor force and basic infrastructure to absorb the technology which comes through foreign direct investment. This lack of capabilities and inefficiencies in technological learning prevent spillover impact of MNC's on economic growth of Pakistan. FDI brings capital intensive techniques in developing economies which are labor abundant and developing countries required time for shifting from labor intensive to capital intensive techniques that in why FDI is not effective in most of developing countries like Pakistan.

The results of error correction model in table 11 give information about the short-run speed of adjustment to-wards long-run equilibrium which is 27% per year. This further confirms the short-run movement of the model to-wards long-run equilibrium.

TABLE 5

Error Correction Representation for the Selected ARDL Model

Regressor	Coefficient	Standard Error	T-Ratio[prob]
	2.0134	1.6109	1.2499[.221]

C	.0021287	.8213E-3	2.5918[.015]
EXP)	.085455	.026154	3.2674[.003]
	-.19889	.11654	-1.7066[.098]
MG)	.4242E-3	.0085583	.049560[.961]
	.045213	.023595	1.9162[.065]
	-.0023993	.0072560	-.33066[.743]
)	-.26834	.072197	-3.7168[.001]
Adjusted R-squared = .62306.                      Adj R-squared = .48345			
F(7 , 30) = 6.3757 , prob(F-stat) = [.000]			
R-squared of Dependant Variable = .048924			
Adjusted R-squared of dependant variable = .020883			
F-statistics = 2.3769			

ARDL (1,0,1,1,0,0,1) selected based on Schwarz Bayesian Criterion Dependent variable is  $\ln(Y)$  38 observations used for estimation from 1972 to 2009.

### SENSITIVITY ANALYSIS

At the end, the reliability and goodness of fit of the ARDL model is necessary condition before recommending and forecasting any policy on the basis of results obtained. So stability and diagnostic tests are performed. To examine the serial correlation the Lagrange Multiplier (LM) test are used. Heteroscedasticity are checked using test based on the regression of squared residuals on squared fitted values and for normality, the test based on skewness and Kurtosis of residuals are used. On the basis of  $\chi^2$  Statistics or F-Statistics as given in table 12 we fail to reject the null hypothesis of

- A- No serial correlation
- B- No Heteroscedasticity
- C- Normality of data.

TABLE 6  
Diagnostic Tests

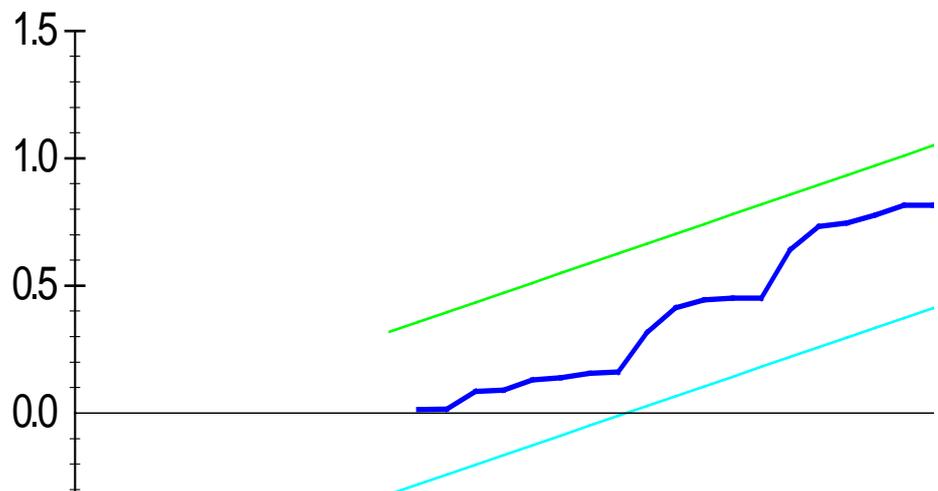
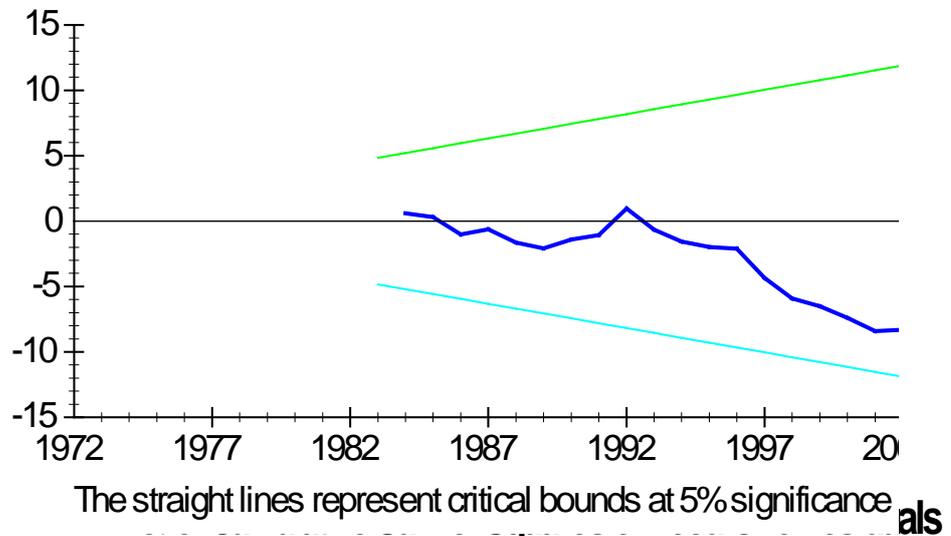
Test	Statistics	F - statistics
Lagrange Multiplier test to check for Serial Correlation	$\chi^2 = 2.1756[.140]$	F= 1.5790[.220]
Skewness & Kurtosis of residuals test for normality	$\chi^2 = .42725[.808]$	-----
F-test to check the heteroscedasticity based on regression of Sq residuals.	$\chi^2 = .76906[.381]$	F= .74363[.394]

At the end for examining of stability of coefficients Cumulative Sum of Recursive Residuals (CUSUM) and Cumulative Sum of Squares of Recursive Residuals (CUSUM

square) are used as can be seen from figure 1 and 2 that the fitted line is within 5% critical bounds so the Null Hypothesis of coefficient cannot be rejected. It means that model is stable.

FIGURE 1

### Plot of Cumulative Sum of Recursive Residuals



## CONCLUSION & POLICY RECOMMENDATIONS

On the basis of all the discussion on economic liberalization and estimated results of the model, it can be concluded that openness to both trade and FDI is very crucial and beneficial for Pakistan but to use foreign technology more efficiently, there is need of skilled educated labor force and domestic R&D stocks in order to absorb this technology.

### POLICY RECOMMENDATIONS

To promote the economic growth of Pakistan, there is need to diversify the export base and import duties should be removed from the import of technology goods (capital,

machinery and parts of machinery) and input material and at the same time the imports of unnecessary and luxuries should be reduced through heavy import taxes. There are new opportunities have been opened in Asia and Middle Eastern countries for Pakistan, there is need to boost economic growth by exporting to these markets and by importing the capital goods from these economies at low transportation cost.

Pakistan leadership must take steps to resolve the energy crisis and improve the law and order situation in order to achieve the macroeconomic stability which is vital in boosting economic growth and restoring foreign investor's confidence. Structural reforms that can improve investment climate and competitiveness are necessary to make both foreign direct investment and domestic investment more effective.

There is need of structural transformation through increasing the mobility of capital and labor across sectors and changing their production process in order to enable our firms and entrepreneurs to become globally competitive by diversifying their products. Government can also set up different programs like export investment support fund to transfer public investment to the selected sectors of exportable goods. Acquiring and up gradation of modern technology is necessary for Pakistan in order to move away from low value and traditional export products. This can only be achieved by providing incentives to facilitate technology adoption, acquisition and replacement.

Government should formulate and implement such policies which can enhance the adaptive and absorptive capacities of economy for maximization of technology dissemination. Creation of skilled labor force not only for MNCs, but also for local firms is crucial in order to promote competitive domestic enterprises. Education policies should be changed as the demand for labor force change from industry.

Along with the policies to enhance the absorptive and adoptive capacities of the economy, Government needs to target specific technologies related to the development areas. By providing fiscal or finance incentives, Government can attract these specific technologies into Pakistan. Establishment of Universities, Science and technology parks and other research institutions can generate environment for R & D and innovation and can help to attract high technology investors relevant to priority areas of development strategies.

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