Globalization: Information Technology and Economic Growth Nexus: Empirical Evidence from ARDL Model Approach to Co-integration and Causality Analysis

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Abstract

This study provides a realistic examination of link between economic growth, information technology and its elements with particular attention on the stock market advancement in Pakistan. Our results recommend a positive connection between well-organized stock market and economic growth equally in long run and short run. In financial theory globalization information technology would affect the increase economic development. This study investigates the influence of globalization and economic advancement on income disparity in Pakistan. In this study, we used the annual time series data and also used autoregressive distributed lag model (ARDL) econometric technique. We collected this data 1973 to 2014 from state bank of Pakistan and international financial statistics. From this study, it is decided that, globalization information technology has substantial effect on income parity; the economic growth rate is also achieving the income equality. In the policy outlook trade openness, foreign payment, foreign direct investment, may contribute in reducing inequality, the key variables used in this study are like savings, inflation, and exchange rate, gross domestic product, investment. This implies that, if this country wants to increase the economic growth, then to formulate and strictly implement some particular policies that facilitate investment in ICT.

Keywords: Investment, savings, inflation, exchange rate, ADF, price index

Introduction

The linkage among growth of economic information and communication technology is a question arise that Cary on the understood theoretical and empirical interest. By doing so in fact by examining in ICT, it is expected for advanced countries to leapfrog aspects of advancement whether than grip with advanced countries taking the necessary of these events near growth of economy lies at every level of the present curricular on investment in the field IT and its impacts on economic growth and advancement:

IT provides a best prospect for under developed countries, technologies like as personal computers broadband and internet have made a global network of every individuals. In the advanced countries a latest communication structure is not just necessary for domestic growth of economic but also its importance increasing day by day in competitive world markets and much needed also for new investment, while there is an important evidence that the modern technology are in different ways convert how much latest economies survive. In fact a rise in investment and a lot of aspects of economic characteristics against firms in industrial countries in recently study on the important role of IT on economic growth has been varied.

Kramer and Dedrick (2001) study of Singapore: and joseph (2002) on India shows that IT participated to growth of economy with this study some papers have indulge a lot of procedures of technology and telecommunication linked variables between such device variables. If a complemen-

tary linkage between IT and new communication technology and foreign investment exists then FDI may arise due to the available IT with in a country. The increasing way in the Foreign investment bring about many reasons including like technical promotes in the field of telecommunication services, along with Globerman and Kokko (2000) described the effective effected influence of FDI is just raised in the atmosphere qualities by a free trade, investment and macroeconomics constancy. The objective of such paper is to examining. If the general linkage between growth of economy and new communication technology. Globalization has become the Essential method to express the change in world politics and international economics. Economists define this with free movement of goods and services capital and labour, Globalization is the solution to decline the communication and transportation costs, less trade barriers increasing capital flows raised competition more communication policymakers in advanced countries search a lot of causes to be hesitant of embracing like such unintended negative results income inequality exists so that poverty is a greater problem in distribution not in production. Pakistan is also trying for a long time to reforming their economic policies and their institutions for progress in larger openness, now the question is that, whether these reforms are successful worked to produce the expected growth. To examine how the Globalization process impacts growth and inequality of income in our country Pakistan some points are following.

The main purpose of our learning is to examine the impact of economic growth and globalizations on inequality of income in Pakistan are following

- To examine the effect of growth on income inequality
- To express the economy growth performance
- To describe the effects of trade liberalization on inequality of income

This study describes the practical indication that there are many aspects of globalization first is the uninterrupted impact of globalization on the development of economy and so on, globalization provides a necessary role in explaining the growing rates, the second role is indirect technology convert as a facilitator. Recently the IT and new communication technology has become an important share of the budget. In fact both consumers and firms use computerize communication internetworking in development objectives. In fact IT and new communication technology is the combination of telecommunication electronics software, hardware, computer aided network and the optical and microwave media. In this article we try to investigate the linkage between economic growth and information communication technology of Gross Domestic Product in 159 evidences for association between information communication technology investment and Development of economic.

Information and communication technology defines a notion that indulge computerizes equipment. In fact a lot of economics argued that this Coues is an uninterrupted result of the debility in the prices of computers. Information and communication technology investment also had a very significant effect on growth of economy. This shows the effect of hardware communication and software on economic development for the set of the developed industrialized, advance countries. There is no clear evidence that the effect of information communication technology on the efficiency in advanced countries. We examine the impact of information communication technology on the manpower and growth. The special purposes are to maintain the existence of thinkable links among information technology, new communication and manpower, to examine the effect of information communication technology and capital to the process of productivity growth. We use nonparametric techniques to investigate this. In calculation we make evaluation the links among information technology, new communication networks and human capital. The recent study provides the evidence that there exists some nonlinear links between manpower and growth of economy, see Kalaitzidakis et al (2001) and Savivides and Stongos (2006).

The human capital stock data are collected from dhareshwar and vikram (1993) these data covers the years from 1950 to 1990. Each country has its own different economic methods, now a

days the globalization markets are not dependable with determined in decision making progress. Globalization is a multidimensional concept due to the reason that, it covers many places like political, social economic regions. Globalization promotes to enhance intrigued world economy with decreasing professional obstacles restricted less capital movement labour reasonable and laissez fair economy. Under Globalization different people do different things. We attentive on globalization in means of free trade and trade openness, after the end in 1982 the policymakers of Bangladesh suggests arise freely trade procedure which describes a new measurement to the economy according to Hultman (1967) a country trade is nearly with the aspects of development and advancement, to increase the production power of a country and shifts the production possibility frontier (PPF) of a country upward, theoretically imports can play an effective play in

The development of economy and possible capital growth for efficiency rise has become the need of time to cope with the global standards and survival. Internationally trade market of Bangladesh there are some countries that invest, according to Sultan (2008), there is no important relationship in the growth of trades of GDP using the annual data for 1965-2004 from WDI .D Lehman and siliverstovs B (2006) examined the similar solution for the economy.

They used a lot of questions and different techniques. It also increasing labour efficiency due to concentration rising wages and rising jobs chances in order to fulfill the huge exports demand and describes motivations to attain the economies of scale because of high productivity. Recently information and new communication technology has become an important part of development. On the other hand less developed countries may have some advantages than developed countries due to information and communication technology.

A still rising in the general price level in the particular time is called inflation or it is a condition in which a lot of money purchases a few goods. The first definition refers to the general condition and second is mainly refers to monetary. The theory of inflation is particularly used to analysis the trend of rising general price level in particular time period depends on one year, general price level should be depend on the price of the most essential goods and services in an economy. The price of goods and services are jointly to attain a price index. Because of enhance in employment level or reduction in taxes. As income level increase, consumer arise their sending's with given level of production. Economic growth is the rising in trade of the goods and services produced by economy. During 1980 the developing countries started freely their economies. Due to globalization financial markets are becoming more and more essential every day. Investment can be important for developing countries.

In Figure 1 EXH on 1974-82, is 9.91 then continuously increasing, that is 12.71-102.86. Now we see in graph of GDP in this graph the value on 1974 is 1.9, on 1975, value is 2.0, then 1976-78, GDP is decreasing, in 1979 again 2.0, then 1980-83, again decreasing, in 1981, 2.0, 1982-83 decreasing again 1984-91, GDP is continuously decreasing , in 1992 the value of GDP is 2.0, in the era of 1993-2008, GDP is circulate round about 0.8-2.1, in 2009 GDP is in negative then in 2010 1.3 and in 2014 again decrease on 0.1. In the graph of M2 the value of M2 is continuously increasing from 1974-2014. Therefore, the curve of M2 is upward sloping. In the end we see the graph of PIN the value in 1974-75 is 3.06, in 1976-2007, the value is increasing. Similarly, saving and IV is decreasing and increasing situation. The trend line is shown in single graph of all variables. In this graph clearly show gross fixed capital formation curve is upward sloping, RGDP, LFPR and EDU. Exp curves are change in different ways. The CPI also shows the situation of increasing and decreasing values. In Figure 1, the graph is drawn by the help of given data schedule.
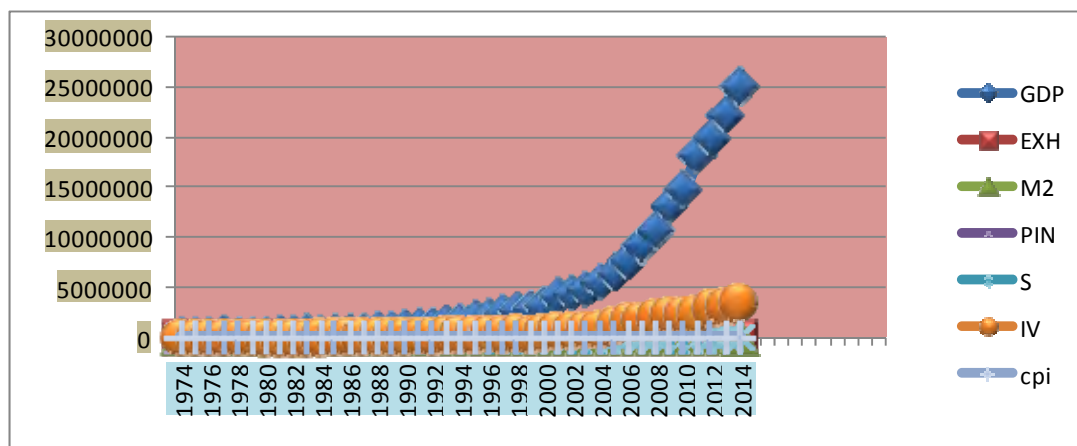
Figure 1. Trend Dependent and Independent Variables
Source: Pakistan Economic Survey and World Development Indicators

Literature reviews

Mushtaq Bhatti (2001) worked on financial depth and economic growth in Pakistan. It was associated with time series data and this data was discussed in (1979-2000) Different techniques were used in this study like unit root, ARDL. He uses a set of variables. The independent variables were used in this study like financial development, political rights, trade openness, and civil liberties while real GDP was used as a dependent variable. So there is available a long run links between variables .we concluded that there exist a helpful connection between growth of economy and financial progress.

Khan and Faridi (2008) attempts to explored the impact on globalization and economic growth on income distribution a case study of Pakistan .Time series data was used in this paper. This data was discussed in (1970-2005) OLS technique was used in this study. Different variables were used in this paper like GINI-coefficient as a dependent variable. While the independent variables were foreign direct investment, foreign remittances, and trade openness growth rate of real gross domestic production. The results strongly support a long run links between variables. We investigated the effect of economic growth on income inequality and also explain the economic growth had (-IV)

This study was investigated by Salahuddin and Rahman (2010) they worked on the determinants of economic growth in Pakistan, does stock market development play a major role? Time series data was used in this study, and this data was discussed in (1971-2006) ARDL technique was used in this study. Log of real GNP was used as a dependent variable, while independent variables were   market capitalization, Log of financial development, Log of inflation rate, factor productivity, investment, savings, foreign investment etc. The relationship is well established between economic growth and these variables. We examined that the foreign investment impacts the well-known impact on growth and also shows the links between many factors and economic growth with particular attention.

This study was examined by Kettene (2010) worked on the effect of information technology and human capital on economic growth. This data was associated with OECD data for the period (1980-2004) we use nonparametric methods to conclude the effect of IT and manpower on the output of growth by allowing the influence of several inputs (including manpower). The dependent variable was Output. While the independent variables were human Capital, technology index, labor

force. We examined that this study shows the interaction between human capital and ICT capital and also shows the effect of human capital on economic growth.

Ekanayake et al (2011) worked on information technology and economic growth: A casual analysis. The dependent variable was used real GDP per capita, while the independent variables were used in this study like foreign direct investment, information and communication technology. This study was used with time series data. This data was discussed in (1975-2003) different techniques were applied in this study like unit root. We concluded that the main objective of this study was to examine the casual links between IT and growth of economy. It was more necessary to appreciate the facts of numerical division that exists if integration is to succeed among these countries that needs to be addressed.

Karimkhani and Beikzadeh (2012) had been studied the interdisciplinary journal of contemporary research in business investigating the effects of economic integration on employment and economic growth, An empirical analysis of economics .The dependent variable was economic growth. While the independent variables were real exchange rate, employment, KOF referring to globalization index. F test was used as a technique. This data was associated with panel data and discussed in (2001-2009) we concluded that the impact of employment was verified to be confident but unimportant on ECO participants.

Farhadi et al. (2012) worked on information and communication technology use and economic growth. The first was studies employment the growth accounting technique. OLS technique was used in this study. The dependent variable was the first difference of the Ln (GDP) per capita and all variables was in logarithm form. The independent variable was information communication technology. In this form lags of the dependent and independent variables were used as tools. This data was associated with panel data and discussed in (2000-2009) we investigate that the impact of IT use on growth of economy, if such countries want to increase their economic growth so that some particular policies need to implement that facilitate IT use.

Dogan (2013) worked on linkages between different types of globalization and economic growth different techniques were used in this paper like unit root, ADF. Time series data was applied in this study and this data was discussed in (1970-2009) when a method was selected upon testing a hypothesis with respect to the relationship between two non- stationary variables. The dependent variable was economic growth and independent variables were political globalization, social globalization, and overall economic growth. We concluded that examine the casual links among social globalization, political globalization economic globalization, and overall globalization and economic growth in turkey using econometrics.

Khan and Khattak (2013) examined the significance of research and development for economic growth. The case study of Pakistan: different variables were used in this study like output as a dependent variable while the independent variables were physical capital, labor force, health research and development. Ordinary least square (OLS) was used as a methodology Time series data was applied in this study and this data was discussed in (1971-2008) we concluded that arise in investment in education further arise resources and development in Pakistan, in this way research in industry and agriculture needed more arise in output for sustained economic growth.

Samimi and Jenatabadi (2014) they worked on the globalization and economic growth: Empirical evidence on the role of complementarities. This was associated with panel data. This data was examined in (1980-2008) in this study, the OLS technique was used. The dependent variables was gross domestic product, and independent variables were CV vector of control, and KOF economic globalization .we concluded from these results the investigation needed more and more and

only three important results, economic globalization on growth was right, positive, significant indicating the effects on OIC.

Wan, Lee (2014) worked on the impact of product distribution and information technology on carbon emissions and economic growth: empirical evidence in Korea. The dependent variable was used in this study economic growth. While the independent variables were energy resources, product distribution, and information technology. This study investigates the long run equilibrium relationship using co integration methods and granger causality. In this study data was used time series and this data was discussed in (1970-2010) we concluded that on energy resources many things may affect like product distribution and IT.

Kilic (2015) worked on the effect of globalization on economic growth, Analysis for developing countries. This was associated with the panel data and this data was discussed in (1981-2011). Fully modified least squares (FMOLS) was used in this study as a methodology. The dependent variable was real GDP per capita and independent variables were social globalization, political globalization, and economic globalization. ,we concluded that globalization had effects positive on economic growth in developing countries and political progress also arise the economic growth, while social globalization decreased the economic welfare.

Ali et al (2015) worked on the impact of FDI and trade balance on economic growth. A case study of Pakistan. Time series data was applied in this study and this data was discussed in (1990-2014) different techniques was used in this study like ordinary least square (OLS) and unit root. The dependent variable was economic growth, while the independent variables were foreign direct investment, and trade, unpolished, domestic product per head, trade openness and gross capital formation. We concluded that FDI has positive effects on GDP, and trade has a negative impact on GDP, while foreign direct investment has positive relation with GDP.

Yaqub (2016) discussed the impact of foreign direct investment and exports on economic growth of Pakistan. This was associated with time series data and this data was discussed in (1990-2010) different techniques were used in this study like ordinary least square (OLS) unit root .the dependent variable was real GDP, and independent variables were Exports, foreign investment, exchange rate, we concluded that the main objective of FDI was to earn maximum profit and increase superior knowledge, and also foreign direct investment plays a necessary role in economy growth of Pakistan.

Conceptual framework
Concept of Information Technology

Information is a means which has no importance until it is take out managed and utilized information technology contracts with information system, data storage, access, reclamation analysis and able decision making, information technology discusses to the creation gathering, handing out storage performance, and spreading of information and too process and devices that facilitate all this to be ready. Information technology positions family on hardware and software of a computer and telecommunication structure. Assume the instead the world became delayed in a third world battle in 2016.most of the nation's supply are committed to battles effort like as tanks, ships, bullets, and transportation and all of the jobless are enrolled into wars services GDP will rise and unemployment is fall. All of the created goods would be demolished soon after, and little unemployment is poorer than short death rates.

Economic growth is usually intended from data on GDP and residents delivered by countries, numerical assistances. Some countries have major number of unregistered occupational and a lot of employees which are not included and accounted for in the formal affairs .The following points show the measuring economic growth, Per capita output is resolute by output per unit of labor

input hours worked the percentage of the employed stage population actually working and the section of working age population to the total population. The change in rate of GDP population is the summation of rate of change of these four variables and desirable cross product. Arise in labor productivity have traditionally been the most essential basis of real per capita economic growth. The rate of productivity in the United States is decreasing. Rise in productivity lesser the real cost of goods .over the 20 century the real price of many goods declined by over 90 percent. Demographic factors may affect growth by changing the occupation to population ratio and the labor force contribution rate. Creates a demographic transition in which birth rates failure and the normal age of population rise.

Women with less children and superior contact occupation trend to join the labor force in great proportions. There is a less demand for child labor and children fill more years in school. GDP is a reasonable addition of evaluating growth of economy in terms of financial spending if a statistician wants to realize the productive output of the steel industry. For example, he wishes only to path the money price of all of the steel that come into the exact times of time. Association the outputs of all industry dignified the in terms of cash consumed and capitalized and you get the over-all population.

Impact of Globalization and Economic Growth on Income Distribution:

The endogenous growth theory forecasts that rising return to technological revolutions in the advanced countries balances falling returns to capital .in short the neoclassical theory expect the conjunction while the endogenous theory expects the decreasing convergence. Because of variance welfares from economic assimilation and trade limited free fair relation and locked developing countries to produce convinced commodities. Schumpeter as the first economist who said that, the recognition supply created by banking was elements   for the economic growth in the years in the development by smoothing findings. The theoretical model suggests that monetary development impacts the economic growth via two channels.

First the financial growth rise the savings in terms for a lot of assets for financial stock, efficient distribution of savings eventually display the productivity of saving and investment. So a progressive real interest real increases the financial advancement and growth of economy. So there should be a positive relationship among growth of economy, financial advancement, and real interest real. This possible direction between economic growth and financial progress is denoted by Patrick (1966) and the supply top and demand resulting proposition the supply leading shows a causal links from financial advancement to growth of economy. Bardhan in 2004 many studies have examined that globalization does not confer any visible impacts on inequality of economic within nations.

Globalization has a lot of scopes with different effects and can be observed with different outlooks. James (2002) investigated the reasons of globalization in terms of business costs and stressed on ICT, technical changes, and their tenders in Africa. Bhagwati (2000) focused on the trade and FDI. This study shows a view effects between imports and outputs. Therefore it is recommended that, Pakistan may continue with the imports of essential raw materials for value addition. It may pay full cares to improvement the exports.

Methodology

In this GDP used as a dependent variable while the independent variables used in this study like money supply(M_2) exchange rate (EXR) price index (PI) inflation rate (INF) investment (INV) savings (NNS). We collected this data 1974 to 2014 from state bank of Pakistan. Money supply

and exchange rate shows the negative impact while the inflation savings and price index shows the positive impacts.

Model specification

$$LnGDP = \beta_0 - \beta_1 Ln\ EXH - \beta_2 Ln\ M_2 + \beta_3 Ln\ PIN + \beta_4 Ln\ S + \beta_5 Ln\ IV + \beta_6 Ln\ CPI$$
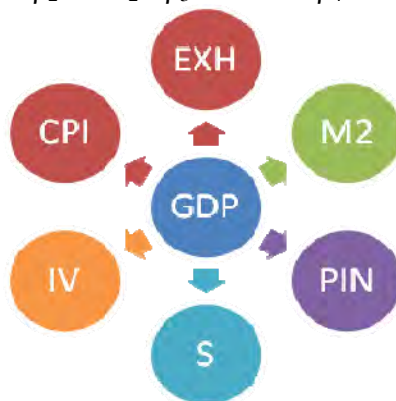
To specify this model we implemented some variables which are under following. Gross domestic product (GDP) used as a dependent variables while the exchange rate (Exe), money supply (M_2), price index (P_1), net national savings (NNS), investment (INV), consumer price index inflation (CPI) used as an independent variables.GDP, CPI, INV, PIN have shown positive impacts on the economy and these variables leads to the economy at greater level while EXE, M2 shown negative impacts on economy because these variables decrease the economic development. There is a natural log of gross domestic product GDP used as a dependent variable while natural log of exchange rate (EXR) and natural log of money supply (M_2), natural log of price index (P_1), natural log of savings (NNS) natural log of investment (INV) natural log of inflation (CPI) used as independent variables.

Description of Variables

GDP

In this model the independent variable is gross domestic product. Real gross domestic product is measuring the value of the production of economy accommodate for change in prices. An economic value that is measuring by the base year prices is called real gross domestic product.

Exchange Rate (EXH)

In economics an exchange rate among two country's money is the change by that one money is Exchange by the others. Exchange rate is also observed as the amount of single currency converted to other country's money. It is a factor of foreign exchange market, which is accessible to a vast dimension of divergent kinds of producers and sellers where country's money selling is continue every time accepting weekends.

Money Supply (M2)

Money supply is the entire stock of currency and other liquid instruments in a country's economy as of a particular time. The money supply can include cash, coins and balances held in checking and savings accounts. Economists analyze the money supply and develop policies revolving around it through controlling interest rates and increasing or decreasing the amount of money flowing in the economy. Money supply data is collected, recorded and published periodically, typically by the country's government or central bank. Public and private sector analysis is performed because of the money supply's possible impacts on price level, inflation and the business cycle. In the United States, the Federal Reserve policy is the most important deciding factor in the money supply.

Price Index (PIN)

Price Index is a distributed moderate of price sibling for given category of goods and services in a liable sector, until a liable spell of time. It is an informative structured to advice to correlate how price sibling, appropriated as a full, change among duration geological district.

Saving (S)

The part of expendable income which cannot spend on the customer goods but acquired exactly in basic material or in refunding off a homeowner's loan or inexactly by bought of bonds. It is that money which we not spend on anything from our salary.

Investment (IV)

Investment is a credit that is acquirement with the desire that it will develop income in the eventual. In financial point, it is the acquirement of goods that are not sell on the day but used in the eventual to make wealth. In economic point, investment is commercial credit bought with the concept that credit will give income in the eventual and be selling at a maximum price.

Inflation (CPI)

It is explained as a continuous raise in the specific point of prices for equipment and benefits. Inflation is deliberate as a yearly percentage raise. As it increases, each dollar in which we make equipment purchases, shortens the percentage of benefit.

Table 1. List of Explanatory Variables with Expected Signs Poverty Model

Variables	Description of Variables	Unit of Measurement
Dependent Variables		
GDP	Gross Domestic Product	Percentage
Independent Variables		
M2	Money Supply	Percentage
EXH	Exchange Rate	Percentage
IV	Investment	Percentage
CPI	Inflation	Percentage
PIN	Price Index	Percentage
S	Savings	Percentage
Source: State Bank Of Pakistan		

Estimation Theory

Estimation theory is a doctrinal organization is collected which means to solve a problems with very simple formation given a set of observations from reality to guess the value a magnitude has taken is under consideration departing from those observations. The estimation theory deals then with given from given explanations, structures a function of them which agrees to attain a value for the unidentified greatness as exact as possible. Obviously, we have no idea that about magnitude but it has some useful connection with the gained remark. Therefore, the estimation theory concerned with these remarks, and these explanations help to attain the possible level at exact source.

Estimation theory classified into two parts,

a.   Parametric estimators:

b.   Non parameters estimators.

These estimators are composed by real facts and by assumptions while non- estimators are collected by non- assumptions

ADF Unit Root Test

The ADF test is a t test in an extended auto regression said and Dicky in (1984) suggest the authority of this test in over-all time series data delivered the interval size. This study persistence an increased dickey fuller (ADF) measurement   tests for identifying the existence of unit root. Though the limit dissemination of the constant valuation dependence on factors, a simple revolution can be useful to reduce the annoyance parameters provided an ADF factor test for this situation. When the time series has an unidentified deterministic tendency, our purpose an improved form the ADF constant test based on quasi differencing in the in the creation of the de trending regression in Elliott et al in (1996). The limit circulation of these test figures is resulting. Practical tender of these tests for common macroeconomic time series in the US economy are testified and associated with common ADF. these tests helps us to examined the non stationary and also help to responsible the drift whether it is stochastic.

Bound test

The economist of some countries adopts different models to treat with exchange rate from last 50 years. So these tests postulate the indication of long run relationship amongst exchange rate, prices of different things and interest rate etc. From this we can get perfect information OR solid validation about equality and non-equality concepts. So at international level this is a big difficulty that how to achieve exchange rate, how it can determined. There is no contented opinions about inflation that how it can show the important level of the exchange rate. But with the passage of time some outlines are disappeared to clarify the exchange rate accurately, so economists of U.S country assume Bound-Tests to define the exchange rate. With the help of Bound- Tests the models contented and the problems of exchange rate resolve.

Auto Regressive Distributed Lag Technique

 In econometric analysis about short run and long run associations consideration on experimental and hypothetical research. When variables show different stationary the investigation becomes more problematical to understand. Stationary concerned with long run co-efficient of variables. But traditional ARDL approach is not appropriate for this analysis. There are some minor illustrations' for performance of ARDL, AIC, ARDL-Sc. There are two steps for parameters estimation;

1st: (1) at the first difference level and 2nd: (0) at the best level.

The ARDL technique used to calculate the standard error of long run parameters.

The following study applied on ARDL during the period of 1973 to 2014.stationarity of not for pre request for this ARDL technique. So the stationary of data tested by order two because ARDL is already combined for order 2. To justify the long run connection between ARDL equation estimated

To justify the long run relationship between ARDL Equation estimated

$$\Delta Y_t = \beta_0 + \beta_1 \sum_{j=1}^{k} \Delta Y_{t-j} + \beta_2 \sum_{j=1}^{k} \Delta X1_{t-j} + \beta_3 \sum_{j=1}^{k} \Delta X2_{t-j} + \beta_4 \sum_{j=1}^{k} \Delta X3_{t-j}$$
$$+ \beta_5 \sum_{j=1}^{k} \Delta X4_{t-j} + \beta_6 \sum_{j=1}^{k} \Delta X5_{t-j} + \beta_7 \sum_{j=1}^{k} \Delta X6_{t-1} + \beta_8 \sum_{j=1}^{k} \Delta X7_{t-1}$$
$$+ \beta_9 \sum_{j=1}^{k} \Delta X8_{t-1} + \delta_1 Y_{t-1} + \delta_2 X1_{t-1} + \delta_3 X2_{t-1} + \delta_4 X3_{t-1} + \delta_5 X4_{t-1}$$
$$+ \delta_6 X5_{t-1} + \delta_7 X6_{t-1} + \delta_8 X7_{t-1} + \delta_9 X8_{t-1}$$

The 2nd step involves the estimation of long run and short run relationship between the variables. The long run model is projected through following equation:

$$Y_t = \beta_0 + \sum_{j=1}^{k} \partial_1 j\, Y_{t-j} + \sum_{j=1}^{k} \beta_1 jX1_{t-j} + \sum_{j=1}^{k} \beta_2 j\, X2_{t-j} + \sum_{j=1}^{k} \beta_3 j\, X3_{t-j} + \sum_{j=1}^{k} \beta_4 jX4_{t-j}$$
$$+ \sum_{j=1}^{k} \beta_5 j\, X5_{t-j} + \sum_{j=1}^{k} \beta_6 jX6_{t-j} + \sum_{j=1}^{k} \beta_7 jX7_{t-j} + \sum_{j=1}^{k} \beta_8 jX8_{t-j} + \epsilon_t$$

The error correction representation of ARDL technique is:

$$\Delta Y_t = \beta_0 + \sum_{j=1}^{k} \partial_1 j\Delta Y_{t-j} + \sum_{j=1}^{k} \beta_1 j\Delta X1_{t-j} + \sum_{j=1}^{k} \beta_2 j\Delta X2_{t-j} + \sum_{j=1}^{k} \beta_3 j\Delta X3_{t-j}$$
$$+ \sum_{j=1}^{k} \beta_4 j\Delta X4_{t-j} + \sum_{j=1}^{k} \beta_5 j\Delta X5_{t-j} + \sum_{j=1}^{k} \beta_6 j\Delta X6_{t-j} + \sum_{j=1}^{k} \beta_7 j\Delta X7_{t-j}$$
$$+ \sum_{j=1}^{k} \beta_8 j\Delta X8_{t-j} + \pi ECM_{t-1} + \mu_t$$

The steadiness of ARDL is practiced through consideration of examination. The sensitivity psychiatry involved the serial co-relation. Function farm, heteroscedasticity and normality. CUSUM and CUSUMSQ constancy of another way to regulate the consistency of ARDL model.

Results
Globalization Information Technology and Economic Growth: An Analysis
To examined the linkages between economic growth and financial globalization, this data composed by state bank of Pakistan from 1973 to 2014.in this paper we use the time series data which is collected by SBP.

It is suggests that, the variables are included for order one. As none of the variables are higher order so ARDL technique can be implied with assurance to examine the effect of globalization information technology and economic growth.

Table 2. ADF Unit Root Test

Variables	At Level			1st Difference			Result
	Intercept	T&I	None	Intercept	T&I	None	
EXH	0.532	-2.489	5.811	-5.094	-5.062	-3.171	I(1)
GDP	-0.635	-3.233	17.398	-7.748	-7.633	-0.842	I(1)
IV	-1.851	-5.156	8.832	-6.385	-6.264	-1.678	I(1)
M	-2.939	-2.758	0.202	-6.054	-6.188	-6.108	I(1)
PIN	-1.311	-2.503	-1.351	-7.574	-7.506	-7.531	I(1)
CPI	-3.405	-3.43	0.142	-6.648	-6.562	-6.737	I(0)
S	-4.453	-4.546	0.3	-6.969	-6.822	-7.073	I(0)
Critical Values:- Intercept: at 1% -3.605 at 5% -2.936 at 10% -2.606							
T&I:- at 1% -4.205 at 5% -3.527 at 10% -3.195							

None:- at 1% -2,624 5% -1.949 at 10% -1.612
Source: Calculate values using E-views 9.5

This table shows the effects of all the standards of variables. We have working the ADF test to investigate the stationary in time series data. In this ADF test we examined the results of variables to understand the stationary of values.

Table 3. Estimate Equation

R-squared	0.999	Mean dependent Var	14.539
Adjusted R-squared	0.999	S.D. dependent Var	1.4855
S.E. of regression	0.0279	Schwarz criterion	-4.0228
Sum squared resid	0.0172	Hannan-Quinn criter	-3.3697
Log likelihood	89.422	Durbin-Watson stat	2.5298
F-statistic	7240.53		
Prob(F-statistic)	0		
Source: Calculate values using E-views 9.5			

This table shows, if the values of R Square are close to one then this shows the best result, if the results of R square are not close to one then difficulty is occur. In this estimation equation best level of R square is 0.99 which is close to one. Now we see, In Durbin Watson stat, the best expected values becomes from 1.5 to 2.5.if Durban Watson values are lies 2 then this shows, there is no auto- correlation.

Table 4. Diagnostic Test

Serial correlation Test	0.2291
Heteroscedasticity Test	0.875
Normality Test	0.7797
Ramsey Reset Test	0.6188
Source: Calculation using E-views 9.5	

The observations of diagnostic table show that in our model no serial correlation, no heteroscedasticity and all inputs normally distributed with each other. The value of Ramsey Reset test shows that no specification error in our model.

Table 5. Bound Test

F-statistics		10.45282
Critical value Bound	LB	UB
Significance 10%	1.99	2.94
Significance 5%	2.27	3.28
Significance 2.5%	2.55	3.61
Significance 1%	2.88	3.99
Source: Calculated value using E-views 9.5		

This table shows the F statistics values, which is high than the all values of others. In fact F statistics values are greater than the lower boundary and also greater than the upper boundary. Therefore, there will be exist co-integration in the long run relationship.

Table 6. Coefficients of Long Run Relationship

ARDL(2,1,0,0,2,2,1)				
Dependent Variable = GDP				
Variable	Coefficient	Std. Error	t-statistics	Probability
CPI	-0.102146	0.16055	-0.636223	0.5312
EXH	-0.13207	0.233151	-0.566457	0.5768
INV	1.10428	0.108821	10.147663	0
M	-1.020085	0.484383	-2.105945	0.0468
PIN	-0.016566	0.024366	-0.679904	0.5037
S	-0.165725	0.124187	-1.33448	0.1957
C	6.125784	2.760262	2.219276	0.0371
Source: Calculated value using E-views 9.5				

In this table of long run relationship, we explain the effects of different variables, which may be positive and negative. Here is CPI (consumer price index), EXR (exchange rate), M (money supply),PIN (price index), S (savings) shows negative impact while, INV(investment), C (consumption) shows positive impact on variables. The effect of variables bases to check the probability. If the probability is less than 0.05 then it will be significant, and if the probability is more than 0.05 then it will be insignificant. T statistics values must be equal to 2. Then it will be significant, if the values of t statistics less than 2 then it will be insignificant.

Table 7. Coefficients of short Run Relationship

Variable	Coefficient	Std. Error	t-statistics	Probability
dGDP	-0.51734	0.109904	-4.707204	0.0001
dCPI	0.017137	0.022416	0.764486	0.4527
dEXH	-0.028976	0.075655	-0.382997	0.7054
dINV	0.316373	0.050217	6.300115	0
dM	-0.147876	0.070539	-2.096371	0.0478
dM(-1)	-0.138723	0.073505	-1.887254	0.0724
dPIN	0.012997	0.005204	2.497671	0.0205
dPIN(-1)	0.010418	0.005285	1.971138	0.0614
dS	0.029612	0.023603	1.254554	0.2228
ECM(-1)	-0.333582	0.034365	-9.706936	0
Source: Calculated value using E-views 9.5				

In this above table shows the coefficient of short run relationship. We will see the effect of positive and negative impacts on variables. Here GDP (gross domestic product), EXE (exchange rate), M (money supply), displays the negative effect, while the CPI, INV (investment), PIN, S (savings) shows positive impacts. The impact of variables bases to tested the probability .if the proba-

bility is less than 0.05 then it will be significant, while if the probability is greater than 0.05 then it will be insignificant.
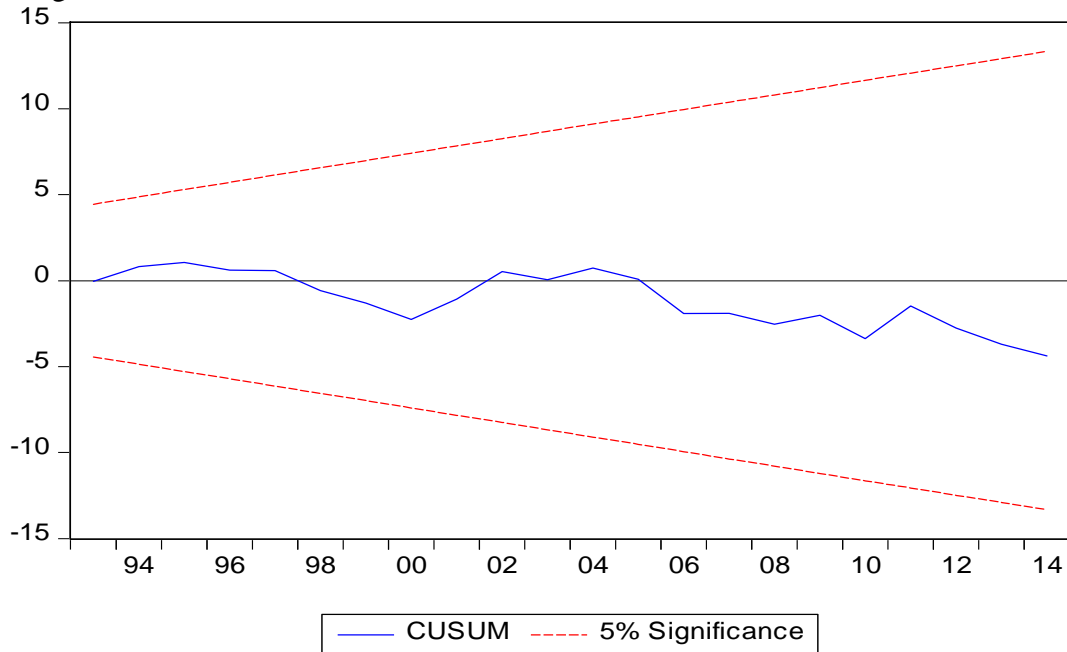

Figure 2. Graph of Cumulative Sum of Recursive Residuals

In this diagram the factors of short run and long run tested by CUSUM tests. The graph of 26 CUSUM lie within these red draw lines and shows 5% level. And this also shows significant. This significant appears that our model is best and totally in stable form.
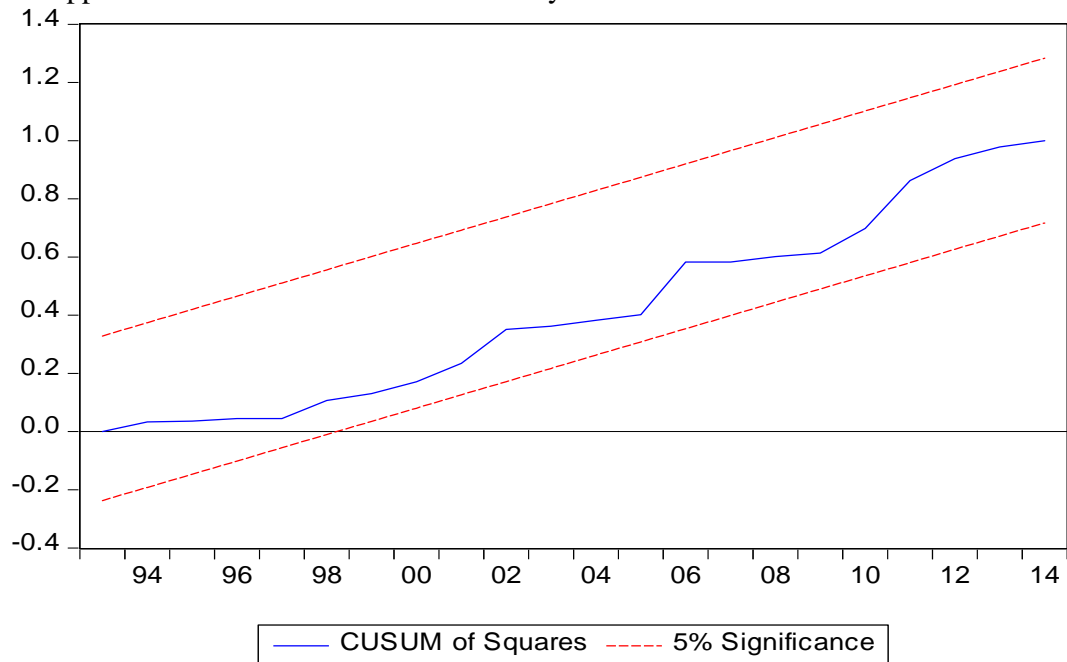

Figure 3. Graph of Cumulative Sum of Squares of Recursive Residuals

The stability in long run and short run considerations is checked by the CUSUM of squares. This diagram of CUSUM square deceits with in red lines which are serious boundaries lines at 5% level therefore shows the level of significant. This condition shows our model is exact and perfect established.

Conclusions

This study shows ARDL bounds testing approach the linkage among many effects and growth of economy with particular care to the linkage between stock market advancement and growth of economy in the long run and in the short run using time series data for Pakistan over the period from 1973-2014. And this also examined the impacts of computer hardware, computer aided software, and new communication tools on economic growth between developed countries. We study the impact of IT on growth of economy and shows that IT has an important impact on the growth of economy, the constant assessing, and the impact of the IT on growth of economy was positive. Our result shows that, there occurs a positive link between stock market progress and economic growth. These consequences are based on theoretical forecasting. Recently in the Pakistan there are only three are only three stock markets like Lahore stock market, Islamabad stock market, and Karachi stock market. According to these consequences of investigation, in 74 less developed countries economic, political and globalization rise, while social globalization is decreased. In fact rise in investment and education will more raise R&D in Pakistan. However, it is more essential to escape harmful impacts of social globalization on growth of economy.

Finally, the practical results of this investigation and the appraisal of the recent position of Pakistan in International trade recommends the following policy references, in this state

a)   To increase economic development, the government may approve solider export advancement schemes in Pakistan. Free trade strategies may be applied i.e. Lowering trade and price obstacles and Easing of trade barriers so that two-sided trade with nearby countries may rise.

b)   Advancement of infra-structure may enable exports, as well as facility of continuous vigor Provisions. Other likely results include increasing the reasons on exports like duty shortcoming /Discount and repayment expenditures.

Policy implementations and Recommendation

The GOVT of Pakistan has implemented a big program. These financial and economic policies are to be held the IMF. Pakistan economy faces major experiments' then GOVT started an economic program which goals to increase the medium –term growth view and move to maintainable economic and outside positions. The program imagines increase and better-targeted support for the poorest families. Pakistan and China have signed agreement establish Pak china economic corridor. In the world trade is expected to enhance and Pakistan will gain through several scopes.

Main exchange associates of Pakistan are increasing with superior view that will hope so have helpful influence on the Pakistan economy. Pakistan is improving quantitatively and qualitatively growth. The goal of government is to discover new markets to trades its human capital as motivations for payment to extra increase its growth. The basic foundation of enhance in the public balance was in national debt that situated at Rs.11,932 billion. Under Pakistan first medium term dues organization policy Government has made development program in attaining the targets. In November 2014 Pakistan effectively repaid to the international Islamic bond market with the issuance of

US$. On education areas 2.1 % of its GDP is spending by the Government of Pakistan recently and in 2018 they totally devote to increase education spending from 2.1% to 4.0% of its GDP.

The GOVT of Pakistan and state bank of Pakistan (SBP) will deliver the fund, so that fund will play an essential role in the Pakistan's promotion in implementing the economic and monetary policies. The following measureable achievements have been set. These joint ventures will create 5,000,000 new jobs in Pakistan related to the ICT sector.

Enhancing the enrollment and quality of advancing students from computer science school in Pakistan. Increase the child population in school and high schools to submission of computer science at an initial age.

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Appendix
Data for Economic Growth in IT Sector

Years	GDP	EXH	M2	PIN	S	*IV*	cpi
1974	88915	9.91	35.90239	3.06		12772	121.4
1975	112054	9.91	33.6679	35.63		20035	157.79
1976	131330	9.91	37.83939	24.5		26456	199.97
1977	151042	9.91	39.35625	19.99	6.89	31734	223.28
1978	177904	9.91	40.03503	11.94	11.95	34647	111.77
1979	196471	9.91	43.11308	11.94	16.12	38354	120.48
1980	235168	9.91	41.49679	32.9	14.16	47667	128.47
1981	278196	9.91	39.0148	13.06	16.65	52207	142.23
1982	324159	9.91	40.79248	7.97	16.23	62447	159.81
1983	364387	12.71	43.87687	14.69	16.47	68462	111.1
1984	419802	13.48	39.85505	17.42	20.22	76401	116.29
1985	472157	15.15	40.66128	14.04	17.2	86525	124.76

Years	GDP	EXH	M2	PIN	S	IV	cpi
1986	514532	16.14	43.30971	11.49	14.69	96545	131.83
1987	572479	17.18	45.31106	10.99	12.28	109540	137.57
1988	675389	17.6	41.36542	16.73	17.18	121666	142.52
1989	769745	19.22	38.98096	23.94	12.96	145570	151.49
1990	855943	21.45	39.1371	0.188008	13.31	162076	167.23
1991	1016724	22.42	39.1899	0.196757	13.95	192857	177.33
1992	1205204	24.84	42.74812	0.191115	18	243894	199.78
1993	1332841	25.96	45.65696	0.194167	16.37	277516	110.58
1994	1561104	30.16	45.75916	0.184761	11.31	305140	121.45
1995	1865822	30.85	43.57085	0.201469	14.13	346045	135.14
1996	2120173	33.57	46.04129	0.197071	12.34	402762	152.73
1997	2428312	38.99	48.20324	0.189105	9.98	435134	169.21
1998	2677656	43.19	47.15023	0.181718	10.27	474245	189.18
1999	2938379	46.79	44.82026	0.175001	11.55	457357	203.96
2000	3147167	51.77	38.5947	0.192719	10.35	503980	215.66
2001	4209873	58.44	39.15125	0.180661	11.55	715525	223.39
2002	4452654	61.43	43.25191	0.172366	13.52	738373	233.24
2003	4875648	58.5	46.42524	0.185569	17.07	817062	103.54
2004	5640580	57.57	48.36162	0.197983	18.69	935096	106.75
2005	6499782	59.34	49.18651	0.199107	18.83	1240240	111.63
2006	7623205	59.86	44.55519	0.228057	17.05	1687809	121.98
2007	9239786	60.63	47.43291	0.235237	12.84	1735885	131.64
2008	10637772	62.55	43.5457	0.253269	12.7	2043074	141.87
2009	13199707	78.5	40.27346	0.241204	8.89	2316480	158.9
2010	14866996	83.8	41.13944	0.249335	13.14	2349663	191.9
2011	18276440	85.5	37.49309	0.284526	14.53	2580748	175.4
2012	20046500	89.24	40.00341	0.28367	14.94	3022202	183.6
2013	22378996	96.79	40.9103	0.277138	14.2	3348190	179.5
2014	25068059	102.86	40.056	0.277138	15.02	3756088	181.6

Source of Data:

State Bank of Pakistan (SBP)

Economic Survey of Pakistan

Statistic Bureau of Pakistan

World Development Indicator (WDI)