Impact of Trade Liberalization on Economic Development in Pakistan: A Co-integration Analysis

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Abstract

This study examines impact of trade liberalization on economic development in Pakistan using ARDL bound testing technique over the period of 1972 to 2015. Taking inspiration from Sen's 'capability' approach Human Development Index (HDI) is used as proxy of economic development. Findings reveal that in the long-run trade liberalization has significant and positive impact on HDI (with and without income component) in all specifications. GDP growth has significant positive impact on HDI in both short and long run, whereas, inflation exerted negative impact in the short run only. Based on empirical findings, we reject anti-trade liberalization argument in favor of both standard argument and broader argument for positive impact of trade liberalization on development in Pakistan. The study suggests that policy makers should have more trade friendly policies in conjunction with growth enhancing and inflation targeting policies to achieve the dream task of development as an explicit prime macroeconomic objective in Pakistan.

Keywords: Trade Liberalization, Economic Development, Human Development Index, Bound Testing, Co-integration.

1. Introduction

Integration into the global economy is considered as an effective factor for nations to enhance economic development along with economic growth. The current global scenario of interlinking with the world has forced the countries not only to engage themselves in global trade and financial flows with rest of the world but also to enable themselves to stand with international markets. Trade liberalization is exchange of goods and services at minimum level of tariff and non-tariff barriers between the nations. According to Edwards (1993), elimination of all trade barriers including exports subsidy and tariffs on imports is called trade liberalization. As a normative concept the notion of economic development takes into account both quantitative as well as qualitative changes. It is a process of social and economic transformation. Seer (1969) describes reduction in unemployment, inequality and poverty, along with growing economy, as economic development. Welfare economists define economic development as a process of improvement in quality of life and socio-economic well-being of inhabitants of country. Economic development is a multidimensional and wider concept as compared to the concept of economic growth (Ray, 1998).

According to Sen (1985, 1999), development refers to expansion in human capabilities. The idea of organized trade liberalization was propounded by Smith (1776). From Adam Smith to Paul Krugman pro-trade liberalization and anti-trade liberalization arguments both are available in economics literature. Most common argument that favors a positive relationship between trade liberalization and development states that higher levels of liberal trade brings higher standard of living ultimately leading to better health facilities, better social services and more education (Davies and Quinlivan, 2006).

Empirical studies of Eusufzai (1996), Wacziarg, (1998), Frankel (1999), Bhagwati and Srinivasan, (2001); Dollar and Kaaray, (2001), Irwin et. al., (2002) Greenaway et. al. (2002), Lundberg and Squire (2003), Yasmin et.al (2006), Hisarciklilar (2009) and Hamid (2013), using different indicators as proxy of development confer evidence of association between trade and development.

On the basis of international economics texts and studies of Asian Development Bank ADB (2004); Social Policy and Development Centre SPDC (2006); United Nation Development Program UNDP (2006); Davies and Quinlivan (2006); a common schematic view of theoretical association between trade liberalization and economic development can be illustrated in the following figure-1:

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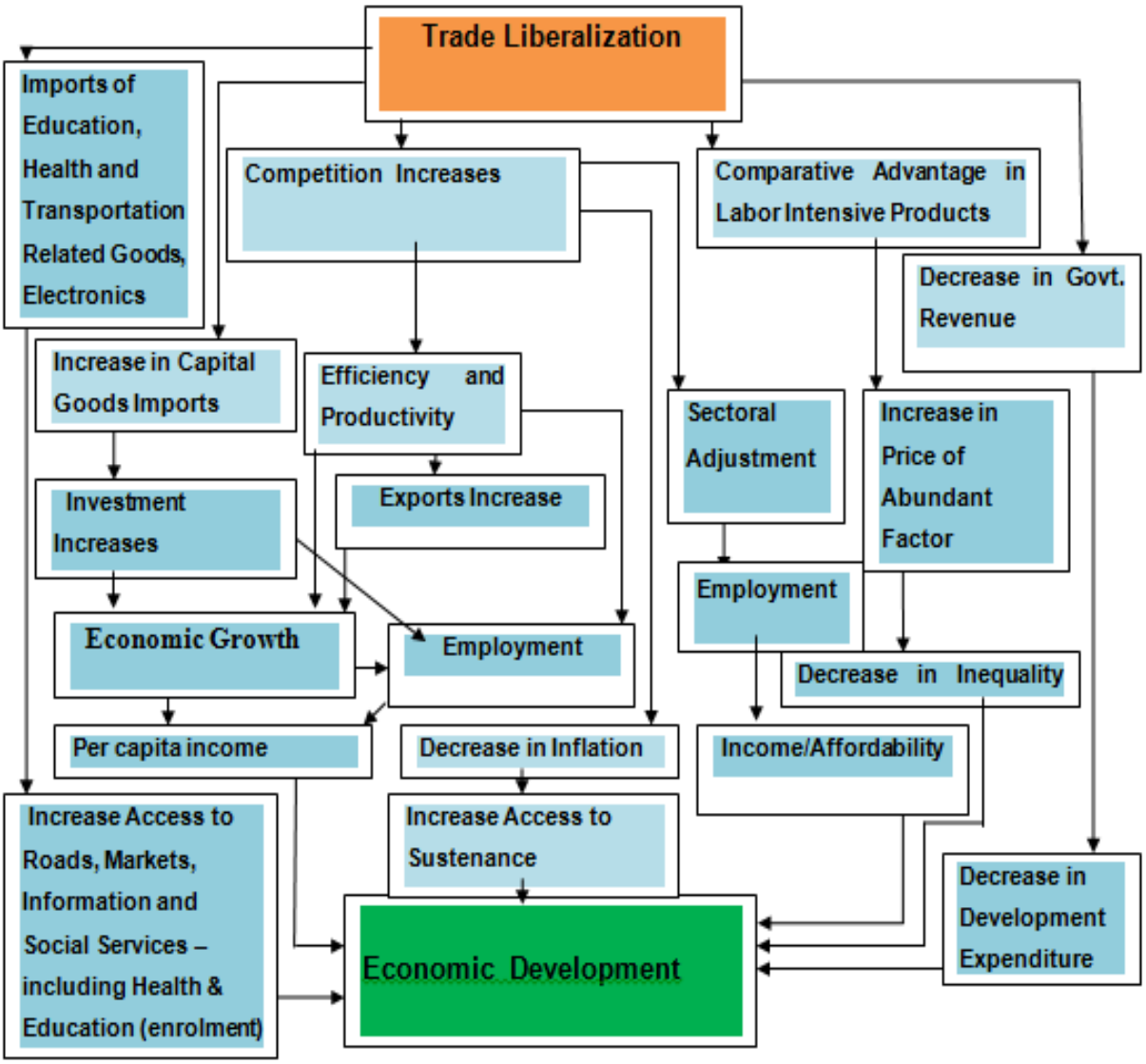
Figure-1 Trade Liberalization and Economic Development --A Schematic View



During the last sixty-nine years average annual economic growth rate of Pakistan economy is around 4.9 %. This satisfactory average pace of growth is achieved by few South Asian countries in the same time frame. However, social and economic outcomes in Pakistan are a mixture of inconsistencies. Asian countries, those were behind, are now better than Pakistan in development indicators. GDP Per capita is 1315.27 USD and 4589 USD in terms of PPP placing Pakistan at rank 146 and 133, respectively in economic development in the world. Human Development Index (HDI) value of Pakistan for 2015 is 0.550. This poor value has lowered the positioning of Pakistan to 147 out of 188 countries (UNDP, 2016). There is no improvement in this ranking from the previous couple of years. Other development indicators like infant mortality rate, literacy rate, female literacy rate, gender inequality-index, prevalence of undernourishment and sustenance are not even comparable with some neighboring countries. Pakistan has not only liberalized its trade but also adopted liberal policy for financial inflows in 1980s, mainly in 1990s. However, desirability and effects of trade liberalization on economic development remained controversial issue in empirical research.

Preceding time series studies on this issue ignore welfare and human development part and take into account only economic aspect of development so far. If human development in Pakistan is the main explicit objective of policy makers then this issue needs serious attention. This paper is an effort to fill this gap by considering 'human-oriented' modern and broader view of economic development and exploring the impact of trade liberalization on development in context of Pakistan. This topic is not so far discussed extensively in this specification in context of Pakistan. This study**,** therefore, is a timely and crucial effort regarding this specific issue. Main objective of this study is to examine, empirically, the impact of trade liberalization on economic development in the short run (SR) and in the long run (LR) by applying autoregressive distributive lag (ARDL) bound testing technique of co-integration.

Remaining scheme of the study comprises of: section 2; literature review including conceptual framework and hypothesis, section 3; methodology, model specification, variables and data, section 4; estimation analysis and section 5; conclusion, recommendations and suggestion for further study.

2. Literature Review

Despite their limitations and severe criticism trade theories of Ricardo (1817), Heckscher-Ohlin (1933), Stolper-Samuelson (1941), Rybzsnski (1955) etc. are a key reference point for the current literature on trade liberalization and economic development. However, effects of trade liberalization on economic development remained dubious issue in empirical research**.** Kraay and David Dollar (2001) have provided most well-known evidence regarding trade liberalization, growth and reduction in absolute poverty. They have concluded that those countries that are rapidly globalizing and are more prone to openness did commendably well in terms of growth of income and reduction of poverty in the past two decades. Most of the South Asia countries have increased their volume of trade and experienced important decrease in all sort of tariff and non-tariff restrictions. Bangladesh has had its trade volume to GDP ratio doubled throughout the decade of 1990 and also observed a significant increase in growth and reduction in poverty. On the other hand, remaining two-third of the developing countries, especially African countries, that did not expand their trade volume and reduced their trade barriers, mainly due to lack of broader outward orientation, remained much behind with respect to growth and poverty reduction. There are so many other studies that presume that growth is good for poor and try to find out a healthy correlation between growth and trade liberalization. Wacziarg (1998), found a link between international trade policy and economic activity. He used panel data of 57 countries for a period of 1979-89. The findings of this study propose that trade liberalization has a strong favorable effect on growth. A similar study by Frankel and Romer (1999), using cross-country data suggests that foreign trade openness has a strong positive relation with the economic growth. Similarly, Dollar (1992), uses data of 95 developing countries for the period of 1976-85 and concludes that there is strong positive effect of measure of export promotion on GDP per capita growth. Another study points out that any country that is close to autarky has not been able to have sustained high growth for a longer period (Bhagwati and Srinivasan , 2001). These empirical evidences show that in long run more the trade openness more will be the increased level of growth and lesser will be the level of poverty. There may be short time costs like decrease in real wage rate of unskilled labour, lower rate of employment, as more competition kicks out the poor performing firms from business. Such costs do not matter in the long run as they are offset by the larger benefits over the period of time, but they need to be addressed to lower the complications and smooth process of development through openness of trade. As per the study did by SPDC (2005), social and economic improvements of economy is influenced by trade liberalization and related policies of the region. This study identified growth, efficiency, technology public finance and sectoral adjustment route through which trade liberalization impact economic development via poverty and income inequality. UNDP (2006) presented a theoretical view that clearly links international trade with economic development via human welfare path. According to this report international trade not only has the ability to change the structure of the economy but also it can gear up the rate of growth. All this will have effect on employment of capital and labor. Foreign trade has a natural tendency to benefit more skilled factor of production than unskilled or non specialized factor. Thus it leads to more capital intensive technologies to be more prevalent causing more inequality. However, this sort of difficulty can be handled by the public policies that are more effective for human development. Two way causation is also suggested in this report by the channel of growth. Ravallion (2006), has presented an analysis of the empirical studies using cross-country contrasts to study the effect of trade liberalization on poverty within economies. Vast variety of studies is highlighted in his research mostly using combined survey-based measures of income inequality, trade openness and other

control factors. The studies of Li et.al (1998), Lundberg and Squire (2003), evaluate the distribution channel impacts of foreign trade liberalization that is measured by "trade volume," defined by sum of exports and imports as percentage of gross domestic product. The results show diverse trends that create ambiguity regarding impact of trade on income inequality and economic development. Dollar and Kraay (2001, 2004), have shown in an influential study that trade volume has no or very little effect on income inequality, contrary to many others which reported unfavorable effects of trade on inequality. This is evident by the findings of Lundberg and Squire (2003), where they have concluded that trade liberalization leads to raise income inequality. Many studies have empirically supported the proposition that trade expansion helps promote growth hence increase in economic development. According to Dollar and Kraay (2004), trade has no effect on income distribution but it increases economic growth. So, it becomes quite possible that it decreases absolute poverty. In a study Ravallion (2006), has tested for China that more trade openness has been an important factor in reducing poverty. Yasmin et.al (2006), using 2SLS technique found that trade liberalization has negative effect on inequality and per capita income but positive effect on employment in Pakistan. High Inflation increases cost of doing business as well as prices of goods and services. The effect of inflation on poverty and inequality remained a debatable issue, in the literature. However, mostly it is stated to be a negative relationship. Romer and Romer (1999), considered the incomes of the poor in the U.S. particularly and globally, in general. They showed that higher inflation with high economic growth, can support the incomes of the poor in short period, but in the long period, it can have deteriorating effect on average incomes and the incomes of the poor by adding to economic uncertainty. Easterly and Fischer (2000), took a huge sample of household survey for a wide range of countries and explored that the poor were more likely to describe inflation as a problem, than the rich. According to them inflation worsened their assessment of own wellbeing as compared to that of the rich. Blejer and Guerrero (1990), found that higher inflation causes lower share of income held by the poorest population for the Philippines. Datt and Ravallion (1998), and Ferreira and Litchfield (2001), had similar results for India and Brazil respectively. . Albanesi (2001) has worked on an economy where government consumption can either be financed via taxation or through inflation. There are outcome based measures (trade volume, growth rates of export growth rates of imports export as share of GDP) and policy measures (tariff revenue, tariff rates, quota, subsidy) with controversy in literature (Bahal and Lau (1992), Edwards (1998).

Eusufzai (1996) found positive correlation between trade liberalization and numerous indicators of human development like infant mortality rate, percentage of population having access to safe drinking water and human development index. Apart from all the findings this study does not show any cause and effect relationship between these indicators leaving a clear wide scope for further research. According to ADB (2004), in South Asia infrastructure improvements enhance access to and use of information, access to and use of health care services, enrolment in educational institutions. ADB found lower travel costs and a lesser time to reach health and education services improve human development. According to UNDP (2006), imports of fuel and vehicles', construction machinery, construction company services, and other related capital and intermediate goods contribute to develop the infrastructure. Improved transportation system not only facilitates integration of an economy to rest of the world but also directly affects human development in the importing country. Imports of agricultural inputs increase per acre yield, and thus farmer income and human development. Import of life saving drugs, and medical equipment and education related equipment have direct impact on human development. Import of simple capital goods and consumer goods may have the greatest of all impacts on human development. For instance electric cookers, water pumps and other related goods, help reduce burden on working and non-working women. Import of other items such as television and mobile phones etc., improve access to information and also bring a change in language, culture and most importantly the way of thinking and ideas– both optimistically and pessimistically thus affecting human development in so many different ways.

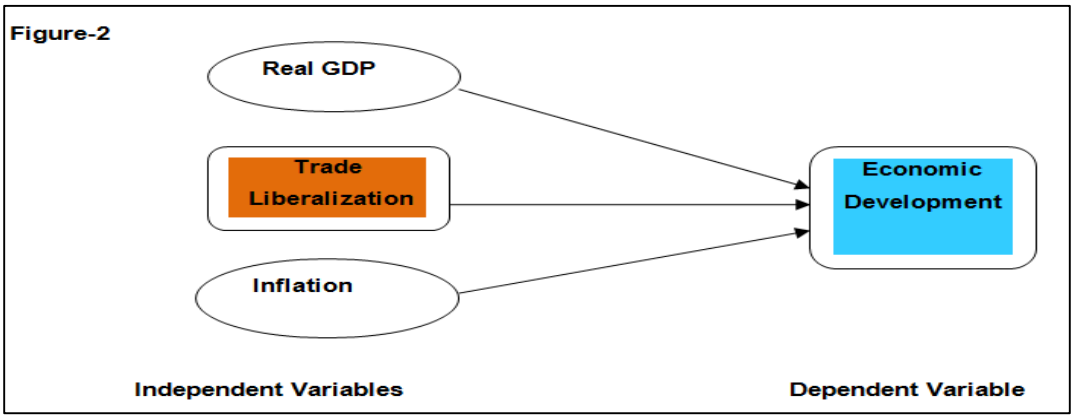
Davies and Quinlivan (2006), found positive impact of openness on social development. They have examined this relationship in 154 countries by using G.M.M method in a panel study 1975 to 2002, and the change in the human development index is used as a function of trade per capita. The study concludes that more the trade liberalization in the country more will be the social welfare and economic development. Gunduz et.al (2009), state comparable findings in their study on trade and social development using various classifications of 106 nations during a time period of 1975- 2005. This study also shows positive and significant relationship between trade openness and human development further revealing that this link is skewed towards high and upper middle income countries when income component of HDI is not

accounted for. In a similar study Hamid and Amin (2013), examined the impact of trade liberalization on development of OIC countries. Using GMM method in a panel data distributed lag model over the period of 1980 to 2005, they found positive and statically significant impact of liberalization of trade on HDI, but statistically insignificant association with HDI (without income component).

Majority of the studies discussed so far have used panel data for different countries over different time periods. Panel data has its own limitations as a result of basic variations between social and economic variables from country to country. The review of literature has revealed that a small number of research works have explored association between liberalization of trade and human welfare as a dimension of economic development. None of the studies have used time series analysis (1972-2015) to investigate the relationship between trade liberalization and human development index as a measure of economic development both in short and long run in Pakistan. Therefore, this study is an attempt to fill this gap by considering 'human-centered' broader and new economic view of development in context of Pakistan.

2.1 Conceptual Framework

Following conceptual framework is derived from literature review. Economic development is dependent variable and trade liberalization, real GDP and inflation are independent variables.



2.2 Hypotheses

H_{o1}: Trade liberalization has no impact on economic development
H_{a1}: Trade liberalization has positive impact on economic development
H_{o2}: GDP growth (control variable) has no impact on economic development
H_{a2}: GDP has positive impact on economic development
H_{o3}: Inflation (control variable) has no impact on economic development
H_{a3}: inflation has negative impact on economic development

3. Methodology, Model Specification, Variables and Data

This is time series study. To explore the impact of international trade liberalization on economic development, partial equilibrium approach is used and secondary data over the period of 1972 to 2015 is collected from World development indicators (WDI), UNDP annual human development reports SPDC annual reports. Using E-View, in this study we examined dynamic relationship of trade liberalization with economic development in short and long run.

There are various techniques used in quantitative research to test the co-integration between variables. This study uses autoregressive distributive lag (ARDL) bound testing procedure of co-integration propounded by Pesaran et.al., (2001).

ARDL technique has some extra advantages. One main edge of this technique is that this approach can be applied even when variables are not in same order. Secondly, this can be applied on small sample. Short run and long run parameters in model can be estimated simultaneously. According to

Laurenceson (2003), ARDL obtains enough number of lags to detain the data generating procedure in the framework of general to specific. A common form of ARDL (p, q) equation is as:

$$Y_t = \alpha + \sum_{j=1}^{p} \lambda_j Y_{t-j} + \sum_{j=0}^{q} \varphi_j X_{t-j} + \varepsilon_t$$

This study employed Augmented Dicky Fuller (ADF) test which is extension of Dicky Fuller (DF) to check stationarity and order of integration of variables in the specified model. Before estimation of model specified maximum lag length has to be chosen. Final Prediction Akaike Information Criterion (AIC), Error (FPE), Hannan Quinn Criterion (HQ) and Schwartz Bayesian Criterion (SBC) can be used (Gebhard *et al*., 2007). In this study AIC is used for optimal lag selection. Statistical soundness of models is checked by using different techniques like; Breusch-Godfrey (BG) LM test, Breusch-Pagan-Godfrey (BPG), Ramsey RESET Test, Jarque-Bera (JB) test are used to test serial correlation, heteroskedasticity, general misspecification and normality, respectively. Structural stability of the estimated model is checked by the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) as suggested by Brown et.al, (1975). The selected models adopted in the study appear to be robust in estimating the long-run as well as short run relationships between dependent and independent variables in the estimated model.

3.1 Model Specification

Two models are specified from studies of Davies and Quinlivan, (2006) and Gunduz, Hisarciklilar and Kaya (2009), with some modifications. Each model has two specifications; one incorporates all components (a decent living standard, education, longevity) of HDI and second excludes income component from HDI composition. Basic functional form of model is as:

Economic Development =f (Trade Liberalization, Control variables)

Following two models are specified:

$$\ln HDI_t = \beta_\circ + \beta_1 \ln TV_t + \beta 2 \ln GDP_t + \beta_3 INF_t + \varepsilon_t \ldots\ldots (1)$$

$$\ln HDI_t = \alpha_\circ + \alpha_1 \ln TPC_t + \alpha_2 \ln GDP_t + \alpha_3 INF_t + \varepsilon_t \ldots (2)$$

Ln = log , HDI = Human development index as measure of economic development
TV = Trade volume as proxy of trade liberalization , GDP = Real gross domestic production INF= inflation rate , ε = white noise error term symbolically, ε~IID (0, σ^2); for t= 1,….,n. t= time subscript, Where in model (1) $\beta_\circ$ is the intercept term $\beta_1, \beta_2, \beta_3,$ are the slope parameters. Where in model (2) TPC = per capita trade (proxy of trade liberalization) α_0 is the intercept term $\alpha_1, \alpha_2, \alpha_3$ are the slope parameters. ARDL (*p, q*) combine version of equation (1) and (2) in unrestricted error-correction form can be framed as:

$$\Delta \ln HDI_t = \gamma_o + \sum_{j=1}^{p-1} \gamma_j \Delta \ln HDI_{t-j} + \sum_{j=0}^{p-1} \delta_j \Delta \ln Z_{t-j} + \varphi\left[\ln HDI_{t-1} - \{\gamma + \psi_i \ln Z_{t-1}\}\right] + \varepsilon_t \ldots (3)$$

Where Z_t is a vector of independent variables *(i.e. TL, GDP, INF),* ψ are the long run coefficients and γ , δ are short run coefficients, while φ and ε are speed of adjustment and error term, respectively. The squire bracket term comprises log run association. This term acts as pushing equilibrium positions: $HDI_t = \gamma + \psi_i Z_t + \mu_t$ were *μ~IID (0,* σ^2 *).* Ho: ψ =0 (no co-integration) and H_a: $\psi \neq$ o (co-intergration). A common error correction form of above equation is framed as:

$$\ln \Delta HDI_t = \phi_o + \sum_{i=1}^{k} \phi_{1i} \ln \Delta HDI_{t-i} + \sum_{j=0}^{k} \phi_{2i} \ln \Delta TL_{t-i} + \sum_{j=0}^{k} \phi_{3i} \ln \Delta GDP_{t-i} + \sum_{j=0}^{k} \phi_{4i} \Delta INF_{t-i} + \lambda EC_{t-1} + \eta_t \ldots (4)$$

Were EC = error correction term and λ = speed of adjustment.

3.2 Construction of Variables and Data

Different measures of economic development are suggested in economics literature like per capita income, poverty, inequality, unemployment and physical quality of life index. According to Anderson (2010), human development index presents better and greater view of economic development as compared to other measures of economic development. According to Streeten (1981), development of a country is not only considered to be growth of per capita income but also the augmentation in the arrangement of human basic material and non-material needs, like health and education. According to Cypher and Diets (2005), human development index (HDI) incorporates those factors which help to create opportunities and environment for individuals to develop their potential and achieve high living standards. Healthy and long life, more education and a decent living standard are indispensable at all levels of development. Countries lacking in these indicators cannot achieve other dimensions of development like social and political freedom, self-esteem and so on (Gallardo, 2009).

This study used HDI as an indicator of economic development. Inspiration of HDI as proxy for economic development is human capability approach proposed by Sen (1985, 1999). Human development index is computed by using UNDP (2005), methodology[1]. HDI index incorporates longevity, educational level and average living standard. Data for computation of HDI is taken from Social policy and development center and World development indicators (2016).

Outcome-based measures, finance-based measure and policy measure are mostly used in literature as proxy for trade liberalization (Bhala and Laue, 1992), (SPDC, 2005). According to Davies and Quinlivan (2006), per capita trade is more suitable proxy for trade where human development is dependent variable. Due to availability of data, trade volume and per capita trade is preferred to be used as proxy for trade liberalization in this study. Data of exports, imports and real gross domestic product and population for the computation of trade volume and trade per capita is taken from WDI (2016). There are different measures of inflation in economics literature like consumer price index, whole sale price index, producer price index and GDP deflator. Inflation used in this study is percentage change in consumer price index over the years. Data of inflation is collected from world development indicators.

4. Estimation Analysis

4.1 Unit Root Estimation

Before estimating the specified model in time series study it is important to check the stationarity and order of integration. This study has used ADF test to investigate stationarity and order of integration of variables**.** Results of ADF show that all variables are stationary at first difference while inflation is stationary and level. It means human development index, real gross domestic product and trade volume has unit root problem at level. Inflation is integrated at *I(0)* and other variables are integrated at *I(1).* There is no variable integrated at second difference. This situation confirms use of ARDL bound test technique for co integration among variables. Table 1 shows results of unit root.

Table No.1 Unit-Root Estimation

	ADF (Without Trend and With Intercept)				ADF (With Trend and Intercept)			
	Level	**Prob.**	**1st Difference**	**Prob.**	**Level**	**Prob.**	**1st Difference**	**Prob.**
LHDI*	-2.932024	0.0613	-3.087606	0.0358	-1.764565	0.7035	-5.972230	0.0001
LHDI**	-2.375976	0.1546	-6.552226	0.0000	-2.757244	0.2206	-6.901512	0.0000
LGDP	-2.283779	0.1819	-4.080214	0.0028	-0.601194	0.9736	-4.754395	0.0023
LTPC	-1.718332	0.4148	-6.134726	0.0000	-3.092303	0.1219	-6.087704	0.0001
LTV	-2.250119	0.1926	-5.646311	0.0000	-3.182329	0.1021	-6.591569	0.0000
INF	-3.411772	0.0162	-7.135287	0.0000	-3.259416	0.0175	-7.272874	0.0000

LHDI* and LHDI** are with and without income component, respectively
Note: all variables are in logarithmic form except inflation.

Model -1.1 $$\ln HDI_t = \beta_\circ + \beta_1 \ln TV_t + \beta_2 \ln GDP_t + \beta_3 INF_t + \varepsilon_t$$

Lag Length Selection

Figure 1 Lag Length Selection

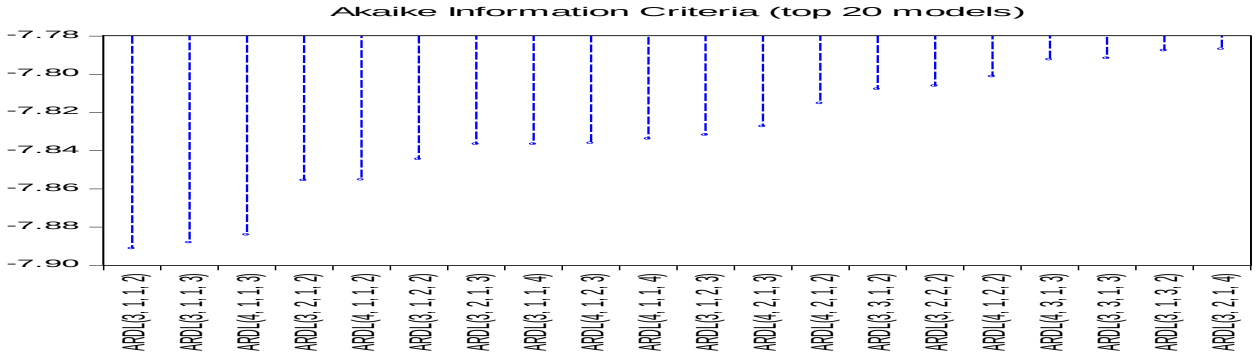


Figure 1 represents optimal lag length of dependent variable and explanatory variables in the model. Above figure shows that AIC (-7.89) of first model out of twenty is lowest hence this model is selected for estimation. Three lags are selected for dependent variable (HDI), while one for trade liberalization (TV), one for gross domestic product (GDP) and two for inflation rate (INF) .

Co-integration Analysis (ARDL Bound Test)

Ho: No co-integration **Ha: There is co-integration**

If F-stat. < Upper bound then we accept null hypothesis. It means there is no LR association between variables. If F stat. > Upper bound then null is rejected. Bound test results given in table 2 shows that F-stat. 12.095 > 4.35 (upper bound value) at 5% level of significance. Therefore, we reject null hypothesis and accept alternate in the favor of co integration at 5% level of significance. We infer that variables in specified model are co-integrated and have long run association.

Table No. 2 ARDL Bound Testing

F-Statistic		**12.095**
Critical Value Bounds		
Significance	10 Bound(Lower)	11Bound (Upper)
10%	2.72	3.77
5%	***3.23***	***4.35***
2.5%	3.69	4.89
1%	4.29	5.61

After the confirmation of co-integration next step is to check long run coefficients of independent variables. Results of long run coefficients in table 3 show that trade to GDP (TV) positive significant (at 5%) effect on HDI. This illustrates that by 1 % increase in the trade liberalization leads to .13% improvement in human development in the long run. Real GDP exerted significant positive impact on human development. The results show that 1% increase in real gross domestic product of Pakistan leads to 0.34% HDI. Inflation elasticity of human development infers that one percent increase in inflation gets 0.001 percent decrease in human development. Coefficient of inflation is negative but insignificant and very small.

Table No. 3 Coefficients (long run)
Dependent Variable LHDI

	Coeffi.	S. E	t-Stat.	P. value
TV	0.136953	0.036455	3.756763***	0.000
LGDP	0.349558	0.007364	47.471566***	0.000
INF	-0.001056	0.000779	-1.355818	0.186
C	-9.441057	0.156294	-60.405819	0.000

Where (***) 1% level of significance

Short Run Representation

The coefficient of EC (-1) is significant (at 5%) and negative as table 4.4 shows. Estimated coefficient of EC (-1) indicates that adjustment speed to long run is o.37. It means that whole system is getting adjusted to LR equilibrium at the pace of 37%.

Table No.4 Coefficients (short run)
Dependent Variable DLHDI

	Coeffi.	S. E	t-Stat	P-values
D(LHDI(-1))	0.184237	0.096743	1.904394*	0.0672
D(LHDI(-2))	0.344714	0.093561	3.684391***	0.0010
D(LTL)	0.009115	0.008858	1.029092	0.3122
D(LGDP)	0.291119	0.045270	6.430706***	0.0000
D(INF)	-0.000896	0.000267	-3.355980***	0.0023
D(INF(-1))	-0.000988	0.000213	-4.645475***	0.0001
EC(-1)	*-0.375587*	*0.072459*	*-5.183430*	*0.0000*
R-sq. =0.803442			**Adj.R-sq.=0.733242**	
F-stat. =11.44515 (0.000)			**D-W =1.765504[1]**	

Where (*), (**) and (***) denotes 10%, 5% and 1% significance level

Table 4 shows that in SR trade volume has positive but insignificant influence on human development In short run trade elasticity of human development implies that one percent rise in volume of trade brings to 0.009% rise in human development. Insignificant and small coefficient implies that trade liberalization is long run process. GDP has positive significant effect on human development in SR while Inflation has negative and significant impact on human development in SR.

Diagnostic Test

Diagnostic results in table 5 indicate that residual are serially un correlated (no serial correlation), homoskedastic (no heteroskedasticity), normally distributed. Model has almost all desired properties. Therefore, results are valid and reliable.

Table No. 5: Diagnostic Test.

B-G LM Test (Autocorrelation)			
F-stat.	0.356642	Prob.	0.7034
Obs*R-sq.	1.041357	Prob.	0.5941
Hetero. Test: B-P-G			
F-stat.	1.019983	Prob.	0.4521
Obs*R-sq.	9.525546	Prob.	0.4050
J.B Normality Test			
Jarque-Bera	1.745882	Prob.	0.4177
Ramsey RESET Test			
F-stat. 0.1288	0.527899	Prob.	0.4737
Likelihood ratio	0.755162		0.3848

Stability test

The figure 2 and 3 show that estimated model is stable and correctly specified.

Figure 2 **Plot CUSUM**

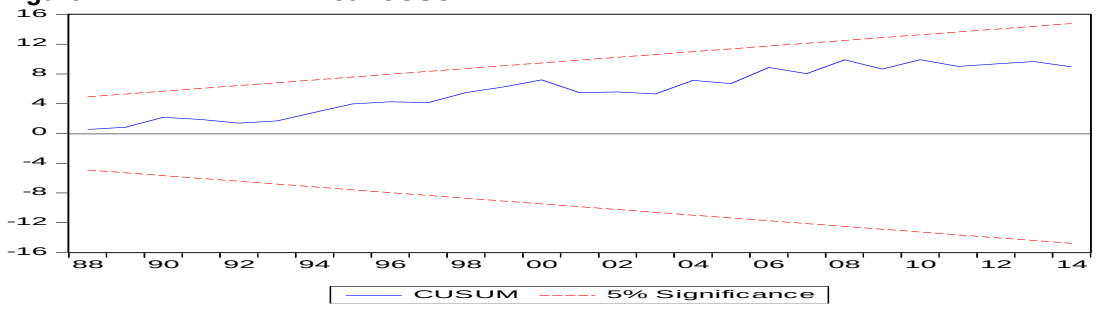
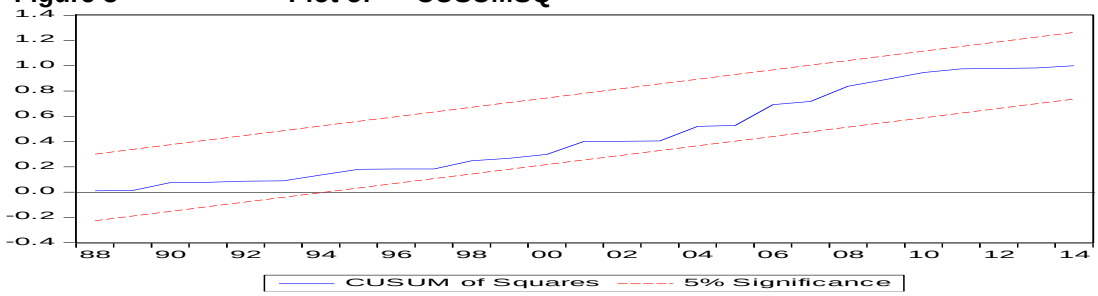


Figure 3 **Plot of CUSUMSQ**

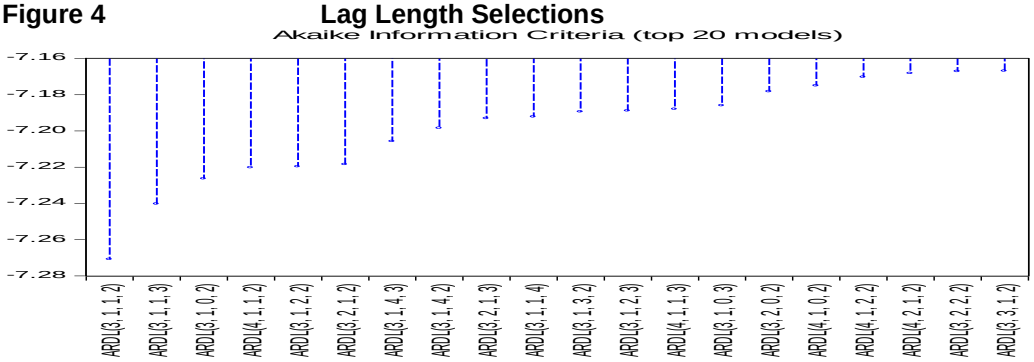


Model-1.2 (HDI Excluding Income Component)

$$\ln HD_t = \beta_\circ + \beta_1 \ln TV_t + \beta_2 \ln GDP_t + \beta_3 INF_t + \varepsilon_t$$

Following figure shows that AIC (-7.27) of first model out of top twenty is lowest hence this model is selected for estimation.

Figure 4 **Lag Length Selections**



Co-integration Analysis (ARDL Bound Test)

Bound test results given in table 4.6 show that at 5 percent level of significance F-statistic 10.93 > 4.35. It indicates long relationship among dependent and independent variables. Therefore we reject null hypothesis and accept in the favor of co integration at 5% level of significance.

Table No. 6 ARDL Bound Testing

	F-Statistic	**10.93190**
Critical Value Bounds		
Significance	10 Bound(Lower)	11Bound (Upper)
10%	2.72	3.77
5%	***3.23***	***4.35***
2.5%	3.69	4.89
1%	4.29	5.61

Long Run Coefficient

Results of long run coefficient show that trade volume has significant positive effect HDI at 5% level of significance as shown in table 7. By 1% rise in the trade volume leads to .24% rise in human development in the long run. There is positive and statistically significant relationship between real gross domestic product and human development. The results show that 1% increase in real gross domestic product of Pakistan leads to 0.38%. Inflation elasticity of human development infers that one percent increase in inflation begets 0.002 percent decrease in human development. Coefficient of inflation is negative but insignificant and economically very small as was in model-1.

Table No. 7 Coefficients (Long Run)

Dependent Variable LHD				
	Coeffi.	**S. E**	**t-Stat**	**P-values**
LTV	0.241398	0.064196	3.760293***	0.0008
LGDP	0.384421	0.012704	30.260592***	0.0000
INF	-0.002262	0.001414	-1.599282	0.1210
C	-10.031729	0.265852	-37.734289	0.0000

Where (***) 5% and 1% significance level

Short Run Representation

The coefficient of EC (-1) is significant (at 5%) and negative, as shown table 4.4. The speed of adjustment to LR is 0.29. Meaning that the deviation from equilibrium is getting adjusted to LR equilibrium at the speed of 29%.

Table No.8 Coefficients (Short Run)

Dependent Variable DLHD				
	Coeff.	**S. E**	**t-Stat.**	**P-values**
D(LHD(-1))	0.237531	0.115603	2.054715**	**0.0493**
D(LHDI(-2))	0.360207	0.111682	3.225300***	**0.0032**
D(LTV)	0.013217	0.012292	1.075197	**0.2915**
D(LGDP)	0.224834	0.063088	3.563811***	**0.0013**
D(INF)	-0.001298	0.000375	-3.460176***	**0.0017**
D(INF(-1))	-0.001337	0.000299	-4.472268***	**0.0001**
EC(-1)	*-0.294202*	*0.058439*	*-5.034377*	***0.0000***
R-sq. = 0.696010			**Adj. R-sq**.= 0.587443	
F-stat.= 16.410840 (0.000)			**D.W.** =1.800059	

Where (**) and (***) denotes 5% and 1% level of significance

Table 8 shows that in SR trade volume has positive but insignificant influence on HDI. In short run trade elasticity of human development implies that one percent rise in volume of trade brings to 0.013% rise in human development. An estimated coefficient of GDP indicates that 1% increase in real GDP growth in Pakistan improves human development by .22% in SR. Inflation has negative and significant impact on human development both at level difference and at difference of first lag. Results endorse that inflation is detrimental for social development in SR.

Table No. 9 **Diagnostic Tests**

B-G LM Test (Autocorrelation)			
F-stat.	0.406434	Prob.	0.6702
Obs*R-sq.	1.182338	Prob.	0.5537
Hetero. Test: B.P.G			
F-stat.	0.866227	Prob.	0.5736
Obs*R-sq.	9.214610	Prob.	0.5119
J.B Normality Test			
Jarque-Bera	0 .398	Prob.	0.819
Ramsey RESE			
F-stat. 0.1288	0.066259	Prob.	0.7988
Likelihood ratio	0.095590		0.7572

Stability test

The figures 4.5 and 4.6 reveals model is stable.

Figure 5 **Plot of CUSUM**

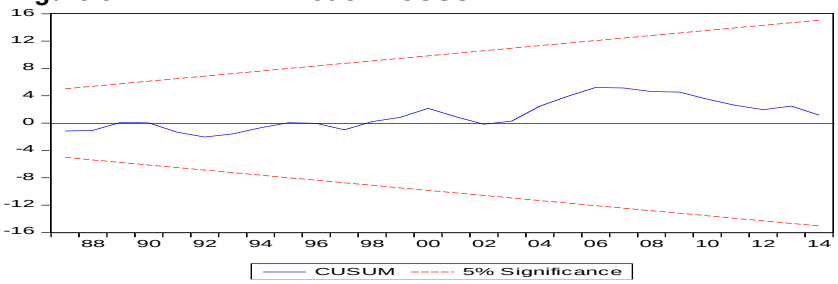
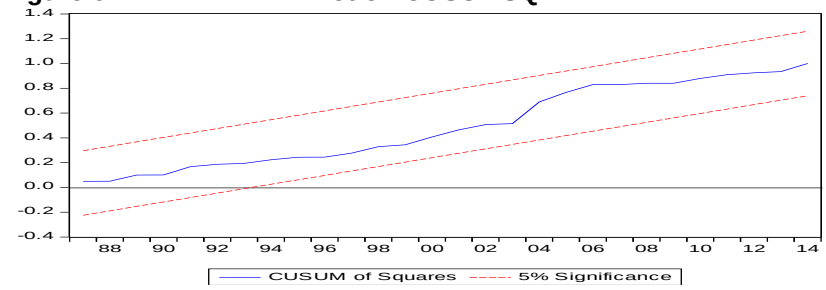


Figure 6 **Plot of CUSUMSQ**



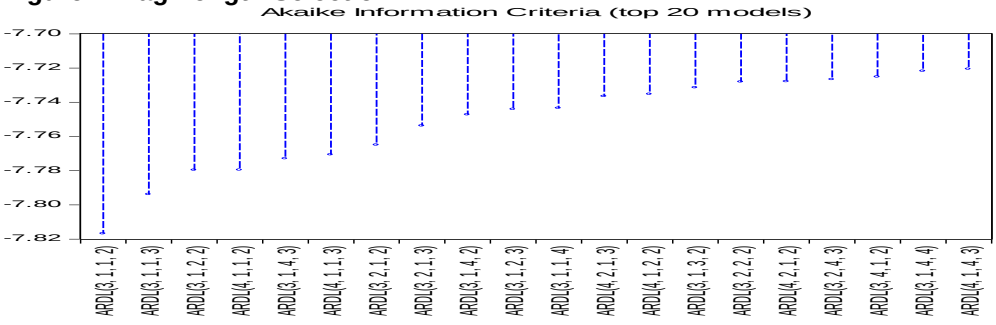
Model-2 .1 **(HDI Including income component)**

$$\ln HDI_t = \beta_\circ + \beta_1 \ln TPC_t + \beta_2 \ln LGDP_t + \beta_3 INF_t + \varepsilon_t$$

Lag Length Selection

Figure 7 shows that AIC (-7.81) of first model out of top twenty is lowest therefore this model is selected for estimation.

Figure 7 Lag Length Selection



Co-integration Analysis (ARDL Bound Tests)

Bound test results are shown in table 10. F-stat.10.145 > 4.35 at 5% significance level. Therefore we reject null hypothesis and accept in the favor of co integration at 5% level of significance. We infer that variables in specified model are co-integrated and have long run association.

Table No. 10 ARDL Bound Testing

F-Statistic		**10.145**
Critical Value Bounds		
Significance	10 Bound(Lower)	11Bound (Upper)
5%	***3.23***	***4.35***

Results of long run coefficients in table 11 show that trade per capita (TPC) exerted positive significant (at 5%) effect on HDI in LR. This illustrates that by 1 % increase in the trade liberalization leads to .14% improvement in human development in the long run. Real GDP exerted significant positive impact on human development. The results show that 1% increase in real gross domestic product of Pakistan leads to 0.28% improvement in HDI. Inflation elasticity of human development infers that one percent increase in inflation gets 0.001 percent decrease in human development. Coefficient of inflation is negative but insignificant and very small in LR.

Table No. 11 Coefficients (Long Run)

Dependent Variable LHDI				
	Coefficient	**Std. Error**	**t-Stat**	**P-values**
LTPC	0.143124	0.047370	3.021386***	0.0053
LGDP	0.287170	0.014885	19.292260***	0.0000
INF	-0.001351	0.001017	-1.328211	0.1948
C	-8.783151	0.179125	-49.033649	0.0000

Where (***) denotes 5% and 1% level of significance

Short Run Representation

The coefficient of EC (-1) is significant (at 5%) and negative, as shown table 12. The speed of adjustment to LR is 0.32. Meaning that the deviation from equilibrium is getting adjusted to LR equilibrium at the speed of 32%.

Table No. 12 Coefficients (Short Run)

Dependent Variable DLHDI				
	Coeff.	**S. E**	**t-Stat.**	**P-values**
D(LHDI(-1))	0.218324	0.104293	2.093368**	**0.0455**
D(LHDI(-2))	0.315844	0.098499	3.206557***	**0.0033**
D(LTPC)	0.008150	0.009280	0.878161	**0.3873**
D(LGDP)	0.294291	0.048691	6.044024***	**0.0000**
D(IINF)	-0.000909	0.000290	-3.137596	**0.0040**
D(INF(-1))	-0.000985	0.000225	-4.380200***	**0.0002**
EC(-1)	-0.329550	0.076001	-4.336109***	**0.0002**
R-sq. =0.78				**Adj. R**=0.70
F-stat. =10.002 (0.000)				**D.W**=1.93

Where (**) and (***) denotes 5% and 1% level of significance

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Table 12 shows that in SR trade has positive but insignificant influence on human development index. In short run trade elasticity of human development implies that one percent rise in volume of trade brings to 0.008% rise in human development. Insignificant and small coefficient implies that trade liberalization is long run process. GDP has positive significant effect on human development in SR while Inflation has significant negative impact on human development in SR.

Table No.13 Diagnostic Tests

B-G LM Test (Autocorrelation)			
F-stat.	0.578309	Prob.	0.5679
Obs*R-sq.	1.661035	Prob.	0.4358
Heterosk. Test: B.P.G			
F-stat.	1.246773	Prob.	0.3060
Obs*R-sq.	12.01554	Prob.	0.2840
J.B Normality Test			
Jarque-Bera	.475	Prob.	0.487
.Ramsey RESET Test			
F-sta. 0.1288	0.585120	Prob.	0.4509
Likelihood	0.836146	Prob	0.3605

Results in Table 13 show that model is robust from statistical point of view. The figures 8 and 9 show that model is stable

Figure 8 Plot of CUSUM

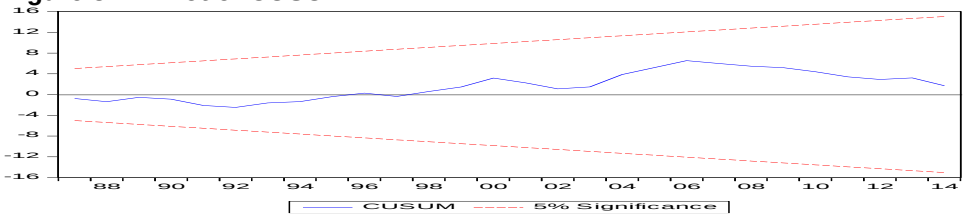
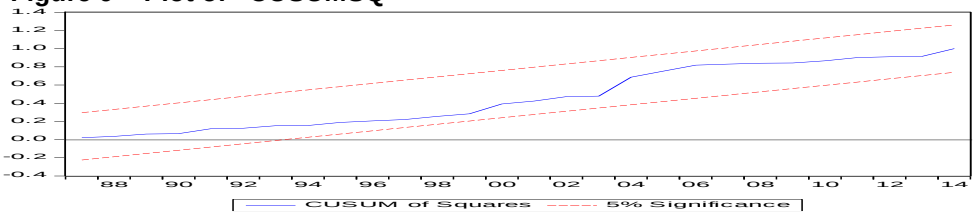


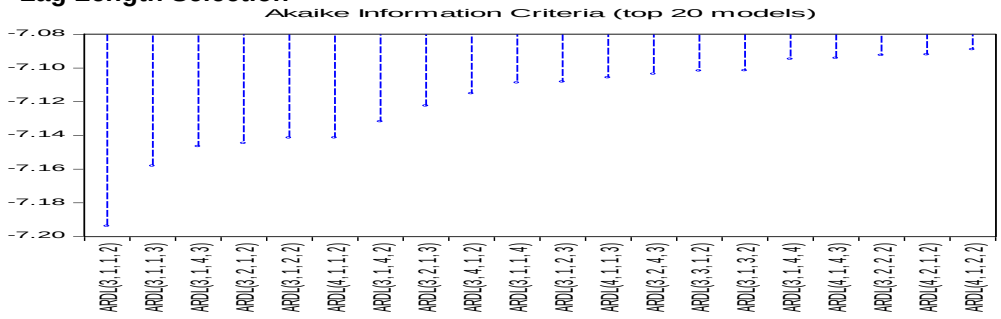
Figure 9 Plot of CUSUMSQ



Model -2.2 (HDI excluding income component)

$$\ln HD_t = \beta_\circ + \beta_1 \ln TPC_t + \beta_2 \ln GDP_t + \beta_3 INF_t + \varepsilon_t$$

Figure 10 Lag Length Selection



Co-integration Analysis (ARDL bound test)

Bound test results given in table 14 show that F-stat .9.410 > 4.35 (upper bound value) at 5% level of significance. Therefore, we reject null hypothesis and accept in the favor of co integration at 5% level of significance. From results we infer that variables in specified model are co-integrated and have long run association.

Table No.14 ARDL Bound Testing

F-Statistic		**9.410**
Bounds		
Sig.	10 Bound(Lower)	11Bound (Upper)
5%	***3.23***	***4.35***

Results of long run coefficients in table 15 show that trade per capita (LTPC) exerted positive significant (at 5%) effect on HDI in LR. By 1 % increase in the trade liberalization leads to 0.259% improvement in human development in the long run. Real GDP exerted significant positive impact on human development. The results show that 1% increase in real gross domestic product of Pakistan leads to 0.272% improvement in HDI. Inflation elasticity of human development infers that one percent increase in inflation gets 0.002 percent decrease in human development. Coefficient of inflation is negative but insignificant and very small in LR.

Table No. 15 Coefficients (Long Run)

Dependent Variable LHDI				
	Coefficient	**Std. Error**	**t-Stat**	**P-values**
LTPC	0.259945	0.087417	2.973635***	0.0060
LGDP	0.272662	0.027102	10.060676***	0.0000
INF	-0.002933	0.001921	-1.526183	0.1382
C	8.864141	0.316277	28.026481	0.0000

Where (***) 1% and 5% level of significance

Short Run Representation

The coefficient of EC (-1) is significant (at 5%) and negative, as shown table 16. The speed of adjustment to LR is 0.24. Meaning that the deviation from equilibrium is getting adjusted to LR equilibrium at the speed of 24%.

Table No.16 Coefficients (Short Run)

Dependent Variable DLHD				
	Coeff.	**S. E**	**t-Stat.**	**P-values**
D(LHDI(-1))	0.270929	0.122175	2.217540**	0.0349
D(LHDI(-2))	0.330772	0.115954	2.852608***	0.0081
D(LTPC)	0.011488	0.012690	0.905257	0.3731
D(LGDP)	0.224196	0.067539	3.319491***	0.0025
D(INF)	-0.001312	0.000402	-3.263940***	0.0029
D(INF(-1))	-0.001320	0.000313	-4.223217***	0.0002
EC(-1)	*-0.249347*	*0.060446*	*-4.125084****	*0.0003*
R- sq. = 0.68			**AdJ. R = 0.55**	
F-stat. = 5.62 (0.0001)			**D-W = 1.70**	

Where (*), (**) and (***) denotes 10%, 5% and 1% level of significance

Table 16 shows that in SR per capita trade (LPCI) has positive but insignificant influence on human development index. In short run trade elasticity of human development implies that one percent rise in trade liberalization brings 0.11% rise in human development. Estimated coefficient of GDP indicates that 1% increase in real GDP growth in Pakistan improves human development by .22% in SR. Inflation has negative and significant impact on human development. Findings indicate that in Pakistan inflation is detrimental for social development in SR

Diagnostic Test

Dagnostic results in table 17 indicate that statistically model is robust and good fit.

Table No.17 Diagnostic Tests

B-G LM Test (Autocorrelation)			
F-stat.	0.595464	Prob.	0.558
.Obs*R-sq.	1.708151	Prob.	0.425
Heterosk. Test: B.P.G			
F-stat.	0.968841	Prob.	0.822
Obs*R-sq.	10.02558	Prob.	0.781
J.B Normality Test			
Jarque-Bera	0.326	Prob.	0.849
.Ramsey RESET Test			
F-stat. 0.1288	2.348401	Prob.	0.988
Likelihood	2.913932	Prob	0.997

Following figures of CUSUM and CUSUMSQ confirm stability of the model**.**

Figure 11 Plot of CUSUM

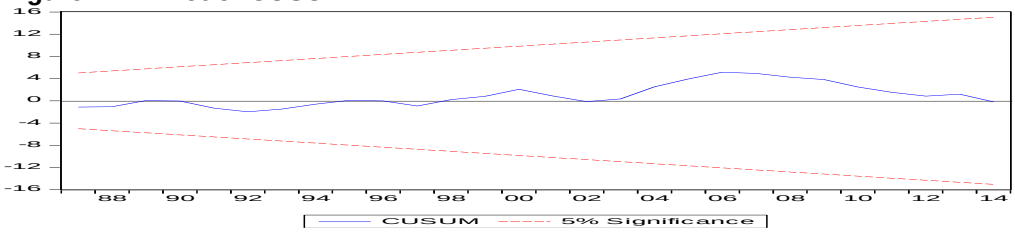
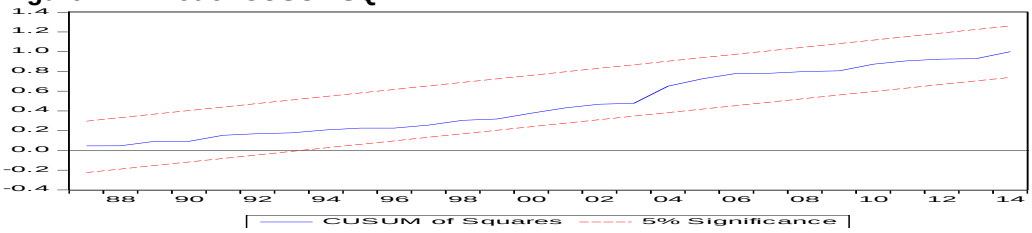


Figure 12 Plot of CUSUMSQ



4.2 Analysis Summary

F-statistic > upper bound critical value (4.35) at 5 percent significance level. This provides indication of co-integration between variables incorporated in all specified model. The estimated coefficients of lagged error-correction (EC-1) are significant (at 5% level of significance) and negative. The feedback coefficients are suggesting adjustment process at the speed of 37%, 29%, 32% and 24% respectively. The estimated coefficients (.13, .24, .14, .25) of trade liberalization are significant (at 5% level of significance) and positive in the LR. However, in SR impact is positive but insignificant. Results of this research are in line with studies of Eusufzai (1996), Arimah (2002), ADB (2004), Davies and Quinlivan, (2006) , UNDP (2006), Gunduz, Hisarciklilar and Kaya (2009).

5. Conclusion and Recommendations

Using ARDL bound testing approach for co-integration; this study examines impact of trade liberalization on economic development in Pakistan over the period of 1972 to -2015. Estimation analysis reveals long run association between trade liberalization and development in all specifications. Findings illustrate that trade volume (TV) and per capita trade (TPC), both have significant positive impact on HDI. Conversely, in the short run, coefficient of trade liberalization exerted positive but insignificant association with HDI. It means more suitable and effective complementary policies are needed to be formulated and implemented in the short run so as to achieve socio-economic improvements in Pakistan. On the basis of empirical findings we can reject anti-trade liberalization and favor both of the standard argument and broader argument for positive impact of trade liberalization on development in Pakistan.

In all models, real gross domestic product and inflation rate are control variables. The real gross domestic product and rate of inflation directly capture the output channel and price channel, respectively, as discussed earlier in literature review and theoretical framework. Results demonstrate that real gross domestic product has a strong positive effect on human development index in all specified models. Therefore, GDP expansion is important in enhancing social development. Moreover, inflation has negative and significant association in the SR but insignificant in the LR with human development index. This illustrates that inflation is detrimental for human welfare in the short run only. Principally, lower inflation can directly enhance the human welfare by making goods and services available more inexpensively.

The study does not conclude that trade liberalization is the only determinant of economic development. Results highlight the significance of trade liberalization in order to enhance human welfare in the long run in Pakistan. Moreover, findings of this study do not indicate that trade liberalization is panacea that can solve the problem of poor human development in Pakistan without involvement from the governments.

The study suggests that policy makers should have more trade friendly policies in conjunction with growth enhancing and inflation targeting policies to achieve the ultimate objective of human welfare leading to economic development in Pakistan. Furthermore, Pakistan should focus on unskilled and semi-skilled labour intensive techniques of production for export sector to create job opportunities in a labor abundant country. Another pertinent issue to take care of is that the tariff reduction for trade liberalization should not be substituted by cut in development expenditures like health and education because it will make the welfare impact of trade liberalization as counterproductive.

This study initiates to scratch the surface of impact of trade liberalization on economic development and results point out some areas that plead further study. For instance: This study does not empirically examine what are the mechanisms through which trade liberalization affects indicators of economic development. Due to availability of time series data, human development index is used as a proxy for economic development. Similar analysis that use Multidimensional Poverty Index (MPI as proxy of economic development may produce noteworthy findings.

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