Journal of Economics and International Finance Vol. 2(8), pp. 175-182, September 2010
Available online at http://www.academicjournals.org/JEIF
ISSN 2006-9812 ©2010 Academic Journals

Full Length Research Paper

Exploring the causality relationship between trade liberalization, human capital and economic growth: Empirical evidence from Pakistan

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Accepted 30 August, 2010

There is a rapidly growing literature on the interaction between trade liberalization and economic growth but few have analyzed the relationship between trade liberalization, human capital and economic growth. This paper attempts to investigate empirically the causality relationship between trade liberalization, human capital and economic growth in Pakistan by employing co-integration and granger causality techniques of time series econometrics for the period of 1972-2007. The data on trade liberalization and economic growth are taken from the world development indicators, ESDS international website while human capital index is constructed based on the data from Pakistan economic survey. The empirical results reveal that there exist short run and long run co-integration and causality relationships among variables in the growth model. It implies that education and trade openness policies may be feasible with sustained economic growth. It is also found that causality runs from trade liberalization and human capital to economic growth. The results are also consistent with the growth theories and economic literature.

Key words: Trade openness, education, economic growth, co-integration, causality, Pakistan.

INTRODUCTION

Trade liberalization is often considered as a significant tool for increasing economic growth in the world economies. Exports of those countries have greatly liberalized their economies, and consequently these countries have also experienced the fastest growth of GDP. Since the relationship between trade liberalization and economic growth has extensively been analyzed in the world, it remained controversial among policy makers and economists based on empirical findings (Chaudhry and Imran, 2009). Many questions were raised about the relationship between trade and growth in developing countries (Kruger, 1997). However, there is a great consensus that trade policy openness and higher ratios of trade volume to GDP were positively related with economic growth. Many developing countries are liberalizing their economies to become attractive destination for foreign capital inflows. Openness of trade regime can increase the investment and efficiency of investment and also can increase the market size in these countries.

Nevertheless the impact of human capital on economic growth has also received a great attention in the recent years. There are two major approaches to the question of how human capital affects economic growth of an economy. The first is to introduce human capital as an input in the production process (Uzawa, 1965; Lucas, 1988). This implies that there exists correlation between human capital and growth of output. The second approach follows Nelson and Phelps (1966); they consider human capital as a source of productivity growth. Since the stock of human capital determines the capacity of an economy to innovate or to implement existing technologies, thus favouring technology diffusion and catch-up processes, the level of human capital is, in this view, related to the rate of growth. The concept of human capital has attained significant place in the theory of economic growth. However, the problem of its measurement has not been addressed properly in the literature. Mankiw, Romer, and Weil (1992) used a nation's rate of secondary education enrolment as a proxy for human capital. Sala-i-Martin, Doppelhofer and Miller (2004),

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have considered primary school enrolments as a measure of human capital. Barro and Lee (1993) have considered the average years of schooling as a proxy variable for human capital. The theories of human capital (Schultz, 1961; Becker, 1962; 1964) and theories of endogenous growth (Lucas, 1988; Romer, 1990; Rebelo, 1991) reported that knowledge gained a central position in the growth process. In theories of human capital, education appears an essential component of economic growth as well as the link between economic growth and human capital is explicitly presented in the theories of endogenous growth. Therefore, there are many possible channels through which exports can promote the human capital accumulation and human capital can promote growth rate of exports in developing countries.

Endogenous growth theory has an argument that both human capital and exports is the primary engine of growth (Lucas, 1988; Romer, 1990; Young, 1991). There are many possible channels through which exports can promote the human capital accumulation and human capital can promote growth rate of exports in developing countries. On the other hand, feedback effects from human capital accumulation to exports are also possible. Human capital accumulation increases the quality of labour, which in turn, enhances the productivity of the labour force and encourages further exports and economic growth (Chuang, 2000). Empirical studies for different countries and time periods suggest that trade promotes human capital accumulation and vice-versa (Gould and Ruffin, 1995; Hanson and Harrison, 1995; Stokey, 1991; 1996).

Since Pakistan's economic performance has remained wobbly due to inconsistent policies and poor management, while in terms of economic growth rate of major sectors it has been impressive over the time period, Pakistan could not make substantial progress in exports even bringing continuous changes in the trade policies. Nevertheless some important steps were taken to liberalize and encourage the foreign trade during 1980s while trade regime remained neutral in 1990s. However trade performance has improved in the early 2000s.

It is widely acknowledged that education is amongst the prime factor contributing in poverty reduction, employment and production. Human resource development plays a vital and paramount role in economic development, growth and production of any country. Pakistan's standing on the education and health has historically been poor in the world. According to the latest Pakistan Social and Living Standards Measurement (PSLM) Survey 2008-2009, the overall literacy rate (Age 10 and above) is 57% (69% for male and 45% for female) as compared to 56% (69% for male and 44% for female) for 2007-2008. According to the same survey, the overall school attendance, as measured by net enrolment rate for 2008-2009 was 57% as compared to 55% in 2007-2008 (Government of Pakistan, 2009-2010).

Since there are many studies on the trade and economic growth in Pakistan (Khan and Saqib, 1993; Khan et al., 1995; Khan, 1998; Ahmad et al., 2000; Kemal et al., 2002; Quddus and Saeed, 2005; Chaudhry and Imran, 2009) but a very small amount of literature is available on the relationships of trade liberalization, human capital and economic growth. The study fills the gap in the literature to explicate the causality analysis among these variables in Pakistan.

Nevertheless, trade liberalization and human capital have been explained for economic growth separately in the most of the literature, the cointegration analysis has been carried out to examine the causality relationship between trade liberalization, human capital and economic growth in Pakistan.

METHODOLOGY

The study is based on secondary source of time series data covering the time period 1972-2007. An increase in trade openness is often considered the increase in the size of the country's trade. Generally it is considered a proxy for trade liberalisation. The higher level of trade openness reveals the success of trade liberalisation policies. Therefore we use the trade openness (exports plus imports) as percentage of GDP (TRADE) as a measure of trade liberalization. The data on trade liberalization and economic growth are taken from the World development indicators (WDI) published by World Bank downloaded from ESDS international website while human capital index is constructed based on the data from Pakistan Economic Survey. The variables Real Gross Domestic Product (LRGDP), Employed Labour Force (LLABOUR), gross fixed capital formation as percent of GDP, proxy for capital (LCAPITAL), real exports as percent of GDP (LEXPOR) and human capital index (LHCAPT) are selected for empirical analysis based on new economic growth theory.

This study built weighted index of enrolments at different schooling levels to use it as a proxy variable for human capital stock. The study followed the method of Wang and Yao (2003) to construct the human capital index for Pakistan. Wang and Yao (2003) constructed the series on human capital using the perpetual inventory method in a similar fashion as Barro and Lee (2001) for China. Wang and Yao (2003) use the flow variable as the number of graduates completing different schooling levels rather than enrolments at five-year intervals. The result was a weighted index of educational attainment from five years levels of schooling: primary, junior secondary, senior secondary, special secondary and tertiary.

In this study, a slightly different method from Wang and Yao (2003) in the construction of human capital index is employed because of the data limitations. The enrolment ratio of students at different levels of schooling years is taken instead of completed education because of some constraints in the availability of data. According to Pakistan's educational system, the number of enrolments at different levels of schooling years is taken in three categories: primary stage, high school stage and university education. For these three categories, numbers of schooling years are 5, 10 and 16 respectively. Number of schooling years is taken as a weight for each corresponding level of enrolments. At the national level professional education ranges from 14 to 16 years, professional education is considered high quality human capital, so, 16 (maximum levels of schooling) years is taken as a weight for professional education.

The following formula is used to construct the weighted index of enrolments from three levels of schooling: primary, higher secondary and university.

$H_t = (5H_{1t} + 10H_{2t} + 16H_{3t}) / Population_{(t)}$

Where: H_t = Human capital stock at year t, Population $_{(t)}$ = Total population at year t, H_{1t}, H_{2t} and H_{3t} represent the number of enrolments at primary school, higher secondary school, and university levels respectively.

Most of the times, empirical studies of economic growth begin with the neoclassical model, originally proposed by Solow (1956) and extended by Mankiw, Romer, and Weil (1992) to include human capital. This model appears in the general form as:

$$Y_t = A_t \; K_t^{\alpha} \; H_t^{\beta} \; L_t^{1-\alpha-\beta} \; \varepsilon_{1t} \quad (1)$$

Where Y_t = Aggregate production of the economy at time t., A_t = Total factor productivity at time t, K_t = Real capital stock at time t, L_t = Employed labour force at time t, H_t = Human capital stock at time t and ε_{1t} = Usual error term and independent from all the independent variable.

Because this study aims to investigate if and how trade openness affect economic growth via increases in productivity, we assume that total factor productivity can be expressed as a function of trade openness and other exogenous factors Ct:

$$A_t = f\,(T_t\,,\; C_t\,,\; \varepsilon_{2t}) \quad (2)$$

$$A_t = T_{t,}^{\Psi} \; C_t \; \varepsilon_{2t} \quad (3)$$

Where, T_t = Trade openness at time t and ε_{2t} = usual error term and independent from all the independent variables. We combine equation (3) with equation (1) and obtain:

$$Y_t = C_t\,,\; K_{t,}^{\alpha} \; H_{t,}^{\beta} \; L_{t,}^{\gamma} T_{t,}^{\Psi} \; \varepsilon_{3t} \quad (4)$$

Where, ε_{3t} = usual error term and independent from all the independent variables, α = Elasticity of production with respect to K_t, β = Elasticity of production with respect to capital, γ = Elasticity of production with respect to human capital, δ = Elasticity of production with respect to labour force participation and Ψ = Elasticity of production with respect to trade openness.
Taking natural logs (Ln) on both sides of equation (4) gives an estimable linear function:

$$LnY_t = C_{1t} + \alpha LnK_t + \beta LnH_t + \gamma LnL_t + \Psi LnT_t + \varepsilon_{4t} \quad (5)$$

Where, all coefficients are constant elasticities, C_{1t} = Ln Ct is a constant parameter, ε_{4t} is usual error term and is independent of all the independent variables, which reflects the influence of all other factor.

According to equation (5), an econometric model of the selected variables used in this study is given as:

$$LGDP = \beta_1 + \beta_2 \; LTRADE + \beta_3 \; LHCAPT + \beta_4 \; LCAPITAL + \beta_5 \; LLABOUR + u_t \quad (6)$$

To find out the long and short run dynamics between trade liberalization, human capital and economic growth, this study employs time series econometrics, such as analysis of co-integration, error-correction models and Granger causality analysis. According to Granger and Newbold (1974), the OLS estimation of regressions in the presence of non-stationary variables yields spurious regressions. Therefore, testing time series data for stationary is of great importance for reliable results.

The stationary of the variables is determined by performing the Augmented Dickey-Fuller (ADF) test. Dickey and Fuller (1979; 1981) developed a procedure to formally test for non-stationarity. The significant part of their test is that testing for non-stationarity is equivalent to testing for the of a unit root. As the error term is unlikely to be white noise, Dickey and Fuller extended their test procedure suggesting an augmented version of the test which includes extra lagged terms of the dependent variable in order to eliminate autocorrelation. The lag length on the extra terms is either determined by the Akaike information criterion (AIC) or Schwartz Bayesian criterion (SBC) or more usefully by the lag length necessary to whiten the residuals. The ADF test can be performed with intercept, trend and intercept, and none of them.

If the economic series have become non-stationary at level and have the same integration order then co-integration becomes an over-riding requirement for any economic model. The co-integration in multiple equations can be examined only by the Johansen approach. When the variables or series are having co-integrated relationships then the linear combination of these series would be stationary and gives long relationship between the variables. For short-run relationship, error correction model (ECM) is employed. The VECM is a convenient model measuring the correction from disequilibrium of the previous period which has very good economic implications. Nevertheless, Granger causality test has been applied for empirical investigation for causality of the variables in this study.

RESULTS AND DISCUSSION

Before going to the time series econometric analysis, a detailed descriptive analysis is carried out. Our complete data set consists of thirty six years of annual observations from 1972 to 2007 on the selected variables. The descriptive statistics is reported in Table 1 and states that the average of real gross domestic product for our study period is 2660.44 billion rupees with standard deviation of 1318. The average for trade liberalization index is 33.81 while 3.18 is the standard deviation. Human capital index is 0.012 on an average and with deviation 0.006. The variation in labour force participation is more than the capital. Skewness is a measure of symmetry, or more precisely, the lack of symmetry. Therefore, as far as skewness (lack of symmetry) of the variables is concerned GDP, HCAPT and LABOUR are right skewed and rest of the two variables are left skewed. All variables are little skewed to
left or right.

Kurtosis is a measure of whether the data are peaked or flat relative to a normal distribution. Kurtosis statistic of the variables shows that only HCAPT and CAPITAL are leptokurtic (long-tailed or higher peak) and all other variables are platy kurtic (fat or short-tailed). These measures of skewness and kurtosis can be combined to determine whether a random variable follows a normal distribution. A Jarque-Bera (JB) test for normality suggests that residuals are not normally distributed for HCAPT as its value of probability is 0.00. For all other

Table 1. Descriptive statistics analysis, 1972-2007.

	GDP	TRADE	CAPITAL	HCAPT	LABOUR
Mean	2660.444	33.814	16.583	0.012	29.832
Median	2545.000	34.348	17.002	0.011	28.715
Maximum	5550.000	38.910	21.410	0.031	48.070
Minimum	906.000	27.720	11.435	0.005	17.780
Std. Dev.	1318.686	3.180	2.027	0.006	8.284
Skewness	0.416	-0.298	-0.427	1.677	0.533
Kurtosis	2.168	2.185	3.836	5.584	2.390
Jarque-Bera	2.074	1.529	2.145	26.900	2.261
Probability	0.355	0.466	0.342	0.000	0.323
Observations	36.000	36.000	36.000	36.000	36.000

Table 2. Correlation matrix.

	GDP	TRADE	CAPITAL	HCAPT	LABOUR
GDP	1.00	0.29	0.34	0.89	0.99
TRADE	0.29	1.00	0.49	0.19	0.24
CAPITAL	0.34	0.49	1.00	0.45	0.35
HCAPT	0.89	0.19	0.45	1.00	0.91
LABOUR	0.99	0.24	0.35	0.91	1.00

variables included in this study it is concluded that residuals for these variables are normally distributed.

The strength of the relationship of variables is also estimated and reported in Table 2. All variables are positively correlated with each other. The results state that labour force participation and human capital index are highly correlated, capital is moderately correlated and trade openness is weakly correlated with economic growth.

The results of the regression equation (6) conclude that it is spurious regression as $R^2 > d$ (0.98> 0.95). Higher R^2 and significant t ratios are also supporting the argument. So our analysis is shifting towards the application of Time Series econometric techniques. The objective of study is to examine the long run and short run relationships of variables and for this purpose Johansen (1988, 1991) and Johansen-Juselius (1990) tests are being applied. The study investigates the long run dynamic interaction among real gross domestic product and other variables. Nevertheless first step in time series econometrics after finding spurious results is to examine the stationarity of the variables to determine the order of integration of the variables. For this purpose, the Augmented Dickey Fuller (ADF) test developed by Dickey and Fuller (1979) for unit root has been employed at level and at the first difference of each series. Table 3 exhibits the results of the ADF test which clearly shows that time series are not stationary at level but that the first differences of the logarithmic transformations of the series are stationary. When the ADF test is conducted at first difference of each variable, the null hypothesis of non-stationary is easily rejected at 1% significance level as shown in the table. This is consistent with some previous studies of order one, I (1). Table reports the unit root results using ADF tests both with and without trend. Both models indicate that the null of the unit root cannot be rejected for all variables as the absolute values of ADF statistics are well below the 99% critical value of the test statistic. Thus, we concluded that all the variables series are non-stationary; data becomes stationary after the first difference as absolute values of the ADF statistic are now greater than 99 percent critical value of the test statistic. The second step is to determine the optimal lag length.

We estimated the model for a large number of lags and then reduce down to check for the optimal value of Akaike information criterion (AIC) and Schwarz criterion (SBC). By doing this we found that the optimal lag length is 2 lags. Having met these requirements, this study performs co-integration analysis. As described before the maximum likelihood based Johansen (1988, 1991) test and Johansen-Juselius (1990) procedures are used to determine the presence of co-integrating equations in a set of time series data. A trace statistic has been used to test the null hypothesis of r co integrating vectors.

The trace statistics of all three models is estimated to choose which one model is appropriate. It starts with the smaller number of co integrating vectors r = 0 and checks whether the trace statistics for model 2 rejects the null, if yes then proceed to the right and so on hence model 3 suggests that the trace statistic is smaller than the 5%

Table 3. Results of Augmented Dickey-Fuller Test (ADF) for unit root.

Results of unit root test with intercept				Results of unit root test with trend and intercept		
Variable	**Level**	**1st difference**	**Conclusion**	**Level**	**1st difference**	**Conclusion**
LGDP	-1.26	-4.60	I(1)	-1.12	-4.59	I(1)
LLABOUR	0.32	-6.74	I(1)	-1.74	-6.75	I(1)
LCAPITAL	-1.83	-4.12	I(1)	-1.87	-4.07	I(1)
LHCAPT	0.048	-5.76	I(1)	-1.42	-5.72	I(1)
LTRADE	-2.94	-5.95	I(1)	-2.91	-5.87	I(1)

Note: The null hypothesis is that the series is non-stationary, or contains a unit root. The rejection of null hypothesis for ADF test is based on the MacKinnon critical values 1%.

Table 4. Unrestricted Co-integration Rank Test (Maximum Eigen value).

Eigen value	Likelihood ratio	5% Critical value	1% Critical value	Hypothesize no. of CE(s)
0.870	128.351	76.070	84.450	None **
0.637	60.984	53.120	60.160	At most 1 **
0.325	27.541	34.910	41.070	At most 2
0.235	14.551	19.960	24.600	At most 3
0.159	5.702	9.240	12.970	At most 4

Note: *(**) denotes rejection of the hypothesis at 5% (1%) significance level, L.R. test indicates two co-integrating equation (s) at 1% significance level.

and 1% critical values at r = 5. So this model does not show co-integration and we stop our analysis at this point. Model 2 (co-integration with restricted intercepts and no deterministic trend in the data) was found to be the most appropriate.

To determine the sign and magnitude of the long run relationship and elasticities in above equations the co integrating vectors have been normalized on LGDP. The results for the co-integration tests are presented in Table 4. It is concluded that there exists two co-integrating relationships. Table 5 reports the results regarding the coefficients of β matrices in terms of normalized co-integrating coefficients of 1st equation.

There exists long run relationship among the variables. All the variables are statistically significant and all coefficients except human capital have more elastic relationship with economic growth. Trade liberalization has correct sign and has positive impact on economic growth. More specifically, 1% increase in trade openness leads to 3.06% rise in the real gross domestic product and stands more elastic. Human capital and capital both have inverse relation with GDP in long run while labour force participation has the positive impact on GDP.

Since long run association has been observed among these variables, we can also explore the possibility of a short run relationship by using an error correction model (ECM) framework. ECM permits the introduction of past disequilibrium as explanatory variables in the dynamic behaviour of existing variables and thus facilitates in capturing both the short run dynamics and long run relationships among variables.

The vector error correction (VEC) for real gross domestic product and its determinants take the form

$$\Delta z_t = \sum_{i=1}^{\rho} \Gamma_i \Delta z_{t-i} + \prod z_{t-1} + (\chi D_t) + u_t \quad (7)$$

Where Z_t = Set of all variables.

The variable u_t represents random disturbance. D_t is a vector of exogenous variables and χ, $\prod$, Γ_i are vectors of parameters.

Table 6 gives the short run dynamic relationship and the set of short run coefficients in the VECM, which relates the changes in LGDP to changes in other variables and the error term in the lagged periods. Hence the lagged difference terms capture the short run changes in the corresponding level variables. In the ECM specifications, several features of the regression results are shown in the Table 6. The coefficient ECT_{t-1} is significant and does have the correct sign (negative). The coefficient of ECT_{t-1} indicates the speed of adjustment and in this case, 7% adjustment is observed. In other words about 7% of disequilibrium is corrected each year. Trade openness has positive impact on growth but it is not significant, while human capital and physical capital have reverse signs with GDP. Labour force participation is a significant variable and especially has positive impact with two years lag on GDP.

Granger (1969) developed a relatively simple test that defined causality: a variable y_t is said to Granger-cause

Table 5. Normalized co-integrating coefficients: 1 co-integrating Equation(s).

LGDP	LTRADE	LHCAPT	LCAPITAL	LLABOUR	C
1.00	-3.06	0.54	2.21	-2.64	8.23
	0.89	0.34	0.93	0.47	3.71
	(-3.44)	(1.59)	(2.38)	(-5.62)	(2.21)

Note: Figures in parentheses are the t ratios.

Table 6. Results of ECM for short run dynamics.

Dependent variable = *ΔLGDP*		
Independent variable	**Coefficient**	**t-Statistic**
Constant	0.07	-2.69
D(LGDP(-1))	-0.31	-1.25
D(LGDP(-2))	-0.03	-0.16
D(LTRADE(-1))	0.01	0.23
D(LTRADE(-2))	0.04	0.84
D(LHCAPT(-1))	-0.01	-0.27
D(LHCAPT(-2))	-0.059	-1.75
D(LCAPITAL(-1))	-0.02	-0.50
D(LCAPITAL(-2))	0.02	0.45
D(LLABOUR(-1))	-0.29	-1.85
D(LLABOUR(-2))	0.34	1.72
EC_{t-1}	-0.07	-1.91
R-squared	0.64	
Adj. R-squared	0.45	
F-statistic	3.41	

x_t, if x_t can be predicted with greater accuracy by using past values of the y_t variable rather than not using such past values, all other terms remaining unchanged. According to Granger, the presence of co-integrating vector indicates that Granger causality must exists in at least one direction. A variable Granger causes the other variable if it helps forecast its future values. The Granger causality test for the case of two stationary variables y_t and x_t, involves as a first step the estimation of the following vector autoregressive (VAR) model:

$$y_t = a_1 + \sum_{i=1}^{n} \beta_i x_{t-i} + \sum_{j=1}^{m} \gamma_j y_{t-j} + e_{1t} \quad (8)$$

$$x_t = a_2 + \sum_{i=1}^{n} \theta_i x_{t-i} + \sum_{j=1}^{m} \delta_j y_{t-j} + e_{2t} \quad (9)$$

Where, it is assumed that both ε_{yt} and ε_{xt} are uncorrelated white-noise error terms. Since the optimum lag length of VAR is k = 2 based on AIC, the results of Granger causality test are reported in Table 7 and state that there is unidirectional causality between real gross domestic product and trade openness. Human capital and labour force participation are causing the real GDP and results in unidirectional causality.

Conclusion

The study has made an attempt to provide the empirical evidence on the relationship between trade liberalization, human capital and economic growth. The empirical analysis was based on Johansen's co-integration, parsimonious ECM and causality for Pakistan's time series data from 1972 to 2007. The key and significant results of the time series econometric analysis are stated as follows:

1. The unit root test based on ADF indicates that all variables are non-stationary at their level form and become stationary at their first difference, since the variables are integrated of same order, I(1).
2. Johansen's co-integration test indicates that there exists a long-run relationship between economic growth, physical capital, employed labour force, human capital, and trade openness.
3. The results of short run dynamic ECM parsimonious model suggests that trade openness and labour force participation have significant impact on economic growth which indicated the validity of exports led growth hypothesis and New Growth Theory (NGT) for Pakistan.
4. It also suggests that there is unidirectional causality running from labour and trade openness to growth while there is unidirectional causality between human capital and labour force participation to GDP.

Since we conclude that the trade openness and human capital are crucial for Pakistan's long-term economic growth and development, the following policies need to be taken for improving human capital and boosting exports and economic growth in Pakistan:

1. Accelerating economic growth rate to more than 7 percent, sustained macroeconomic stability in all sectors especially in industry and agriculture and creating an investment-friendly business environment are required in Pakistan. At the same time, economic polices should recognize the dynamic economy functioning in an

Table 7. Results of granger causality test

Pair wise Granger causality test sample: 1972-2007 Lags: 2			
Null hypothesis	**Observations**	**F-Statistic**	**Probability**
LTRADE does not Granger Cause LGDP	34	0.33	0.72
LGDP does not Granger Cause LTRADE		3.01	0.06
LHCAPT does not Granger Cause LGDP	34	8.08	0.00
LGDP does not Granger Cause LHCAPT		0.52	0.60
LCAPITAL does not Granger Cause LGDP	34	0.61	0.55
LGDP does not Granger Cause LCAPITAL		2.79	0.08
LLABOUR does not Granger Cause LGDP	34	5.44	0.01
LGDP does not Granger Cause LLABOUR		0.21	0.81
LHCAPT does not Granger Cause LTRADE	34	1.05	0.36
LTRADE does not Granger Cause LHCAPT		0.62	0.54
LCAPITAL does not Granger Cause LTRADE	34	1.31	0.29
LTRADE does not Granger Cause LCAPITAL		0.51	0.60
LLABOUR does not Granger Cause LTRADE	34	0.77	0.47
LTRADE does not Granger Cause LLABOUR		0.87	0.43
LCAPITAL does not Granger Cause LHCAPT	34	0.87	0.43
LHCAPT does not Granger Cause LCAPITAL		0.72	0.50
LLABOUR does not Granger Cause LHCAPT	34	2.29	0.12
LHCAPT does not Granger Cause LLABOUR		0.32	0.73
LLABOUR does not Granger Cause LCAPITAL	34	0.14	0.87
LCAPITAL does not Granger Cause LLABOUR		2.61	0.09

export-oriented policy environment.

2. The government should emphasis on the globally competitive industrialization to open the way for stronger competitiveness and greater export diversification. Therefore, priority must be given to mount the manufactured exports as a part of economic planning. Furthermore, a new class of exporters should be developed through human resource development efforts in Pakistan. Industrial and trade policies should be made particularly aiming at promoting exports of the country.

3. Rising costs of energy (gas, electricity and petrol), tariffs, cost of finance and wages have increased the cost of production and made exports uncompetitive compared with other close competitors. At present the load-shedding issue of energy sources in Pakistan has damaged its economy badly. Therefore, there is an ardent need to take immediate initiatives to address these issues on permanent basis.

4. The government should give priority to human capital development for substantial increase in the existing capacity and quality of human capital by establishing more vocational and training institutions.

5. Knowledge based and technology intensive industries also to be restructured and facilitated by public policies, such as investment in high quality professionals, technical and higher education.

6. Incentive based literacy programs need to be promoted for primary and higher education for the development of human capital.

7. Instead of random selection of regions, districts with high dropout rates, low enrolment and low literacy rates should be targeted on priority basis.

8. To improve access and quality of health services, there is a need to increase health expenditures. Keeping in view these suggestions, the trade liberalization with human capital will raise the sustainable economic growth rate of Pakistan's economy and will bring it at par to the other regional economies like India and China.

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