

Human Capital Formation and Economic Performance: A Case Study of Pakistan

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Abstract

Education is the great pillar of human capital formation. This study analyzes the long run relationship between education enrollment and economic growth in Pakistan. Secondary data has been used in this study for the period of 1972-73 to 2012-13. Augmented Dickey-Fuller test and Johanson-Jeselius cointegration test have been utilized in our model to measure the impact of human capital formation on economic performance of Pakistan. To measure the significant relation among variables for the long run, we will use unrestricted co-integration rank test. The long run results of our study interpret the cointegration among dependent and explanatory variables. In our study, Error correction analysis explores the stability condition. It is also concluded that Education Enrollment Index (LEEI) has positive sign and significant impact on economic growth.

Keywords: Pakistan, Human Capital, Economic Performance, Education Enrollment Index, Co-integration, Error Correction.

1. Introduction

In order to maintain competitive advantages, many countries and organizations have promoted by knowledge based economy, globalization and technological evolution. Broadly speaking, the concept of this human mixture is a blend of human and its resources. There are two types of creating human capital. The first is based on labour and the other is based on knowledge and skill. It can be accepted that the foundations of human resources are based on knowledge and skills. The knowledge which consists of competency and experience is actually known as synonymous expression.

The background of human capital comes from the classical economics in 1776 and resulted as a scientific theory (Fitzsimons, 1999). After the emergence of this theory Schultz (1966) accepted the human capital as one of the most special elements for modern economic growth. Human capital is the stock of knowledge, habits and competencies, cognitive abilities and creativity in the ability to perform labor so as to produce economic value. Many theories connect investment in the development of education and the role of human capital in productive growth and innovations has been referenced as a justification for government aids for education and jobs.

The statistical indicator of estimating human development in each nation is a human development Index (HDI). It is the combination of "Life expectancy Index", "Education Index" and "Income Index". Life expectancy index belongs to the standard of health for the population; education and living standard. The main objective of the present paper is to investigate the impact of human capital formation on economic performance of Pakistan. The rest of the study is arranged as follow. The study provides the performance of educational sector of Pakistan in section 2. Section 3 gives the review of past studies. Data and methodology is interpreted in the section 4. Section 5 discusses the estimation of the analysis. We have offered concluding remarks in the section 6.

2. Educational Sector in Pakistan

Education is the fundamental right of human beings. For the sake of better living standard and the protection of future the role of education is unbelievable. With the help of education, we can develop human capital of the country. The countries which spend more budget on education have dominant economic growth as compared to those countries who keep less education budget. For the sake of economic growth and prosperity we will have to improve the literacy rate of Pakistan. Various Governments of Pakistan have taken various steps to improve the education enrollment at different levels. Different programs are introduced for the achievement of high school enrollment in education policy 2012-13. Primary education has significant importance in the education system. It provides a base for secondary, college and university level. The government of Pakistan has introduced 2 major goals for the achievement of primary education in education policy 2012-13. Millennium Development Goal 2 (To Achieve Universal Primary Education) aims to achieve 100 percent primary

enrollment. The federal and provisional Government has started joint efforts for the attainment of primary enrollment. The federal government budget for education was Rs. 59.28 billion during 2013-14. To achieve the MDGs targets and to accelerate the pace of education the Provincial governments have allocated Rs. 59.440 billion.

The literacy rate is a very fundamental key indicator of education and it leaves a long run impact on other indicators of economy. According to economic survey of Pakistan 2012-13 the literacy rate (10 years and above) of Pakistan is 60 percent. The literacy rate in urban areas is higher than rural areas and the male participation is higher than women. According to economic survey 2012-13 literacy rate in Punjab is (62%), Sindh (60%), literacy rate in Khyber Pakhtunkhwa is (52%) and in Balochistan at (44%). Pre-primary education is a fundamental factor of early childhood. Pre- primary enrollment at the national level had turned down 2.9 from the previous year. It was at 9.28 million in 2012-13 as compared to 9.51 million in 2011-12. Total number of school at primary level in Pakistan were 158.6 thousand and 427.7 teachers were working in these schools according to economic survey 2012-13. The primary enrollment of the country had increased 0.5 percent than the economic survey 2011-12.

At middle level total 42.1 thousand schools having 362.6 thousand teachers were functioning. There was a 3.3 percent increased in middle enrollment during 2012-13. Statistics show that 29,800 Secondary Schools having 489,600 teachers in Pakistan. 7.4 percent increased in secondary enrollment at national level shown as 2.9 million in 2012-13 as compared to 2.7 million in 2011-12. Total 139 universities having 77,600 teachers are working in Pakistan, according to economic survey 2012-13. The enrolled number of students in 2012-13 was 20.8 percent more than the previous year. The total estimated enrollments during 2012-13 was 41.1 million, which was more than 40.3 million in 2011-12. It presents the increase of 2.0 percent.

3. Literature Review

The literature review of various studies shows the dominant role of schooling, on job training and skilled labour force in the economic growth of the countries. The government spending on education becomes the cause to increase the income of household. The studies emphasized that the education is the biggest tool for the production of human capital. It deals with the capabilities of human capital such as skill, knowledge, health facilities and training. In this section we have analyzed the role of education in the economic growth of different countries.

Human capital formation and economic growth in India: A CGE Analysis, Ojha V.P. and Pradhan B.K. (1987) explored that it incorporates a component by which government expenditure on education use to construct human capital enlarges the supply of skilled labour is used to analysis the income distribution and economic growth. He concluded to boost the profits regarding economic growth it is alluring that investment in physical capital be expanded at the same time with investment in human capital.

Schultz, T.P. (1999) analyzed the across countries regressions for the period of 1960-95 to measure ,the poor performance of some health and education indicators in Africa. The study also examined the microeconomic household surveys for the production in Sub-Saharan Africa in connection with health and education. He concluded that high rates of return were only possible due to increase in secondary and post-secondary education. It showed wage discrimination among low level schooling and quality schooling.

Qaisar, A. (2001). Endogenous Growth and Human Capital: A Comparative Study of Pakistan and Sri Lanka explored the impact of human capital formation in economic growth. He used standard growth accounting technique to measure the economic growth of the countries. Some variables used as proxy variable for the accumulation of economic growth. Through ordinary Least Squares method regressions of both the countries were estimated. The results of school enrollment were positive and significant in both the countries.

Tilak J.B.G. (2002) analyzed the various parts of the Indian population, which spent more budget on education and endeavors to evaluate education economic determinants. Specifically, it examines the degree to which the amount spent on education by household reacts to changes in families' income level and spending in education by the government. The study comprised of 1994 data on human development in India supplemented by different sources. He concluded that government expenditure and household expenditure on education are complements to each other. An increase in government spending on education will become the cause to increase in household spending.

Wilson, R.A and Briscoe, G. (2004) examined the relationship between education and training with economic growth. Increased investment in education has a significant impact on productivity and growth of the households. The study analyzed the growth models which represented the relationship between GNP and human resource. The quality of data indicators used in the model showed different results. The study also explored the indirect role of education in reference with the environmental gains, technological and spatial gains to society. So, they concluded that investment in training and education had a significant and positive influence on country economic growth.

In Education as a Factor of Human Capital Formation in Pakistan (1951-1998), Khilji B.A. (2005)

analyzed the impacts of education in increasing economic growth of the country. The study discussed the relationship of Education, Science and Technology. Demographic variables had been used in the study, which implies that population growth affects national resources. The writer came up with the conclusion that education has an important role in the development of any country.

Quddus, M.A. et al., (2010) explored short and the long run relationship between economic growth and education from 1970-71 to 2008-09. The study found cointegration between economic growth and education. Macroeconomic instability was responsible to effect economic growth in the short and long run because of inflation. But, it effected school education in the long run only.

Kakar Z.K. et al. (2011) in Relationship between Education and Economic Growth in Pakistan analyzed the importance of education information on human capital. It examined the long run relationship between education and economic growth. The data have been used from 1980-2009 in the study. While determining the long and the short run relationship of economic growth and education, error correction models have been employed. Educational trends and challenges along with their role in economic growth in Pakistan have been studied as well.

Ali, S. et al (2012) analyzed the impact of human capital formation in the economic growth of Pakistan from 1972 to 2011. They used education enrollment as a proxy in the model. They concluded that some indicators had a positive and dominant impact on GDP, while others had a negative and significant influence on GDP in Pakistan.

Khilji B.A. et al. (2013) in the dynamics of Pakistan's Economic Growth and Human Resources (Comprehensive Approach) pointed out the role of Human Resource in Pakistan's economic growth. Econometric tools of integration and causality from 1951-2011 had been used in the study. Through the study, it had been highlighted that Human Resources had an equilibrium relationship with Gross Domestic product of Pakistan. The literacy rate had a positive impact while total number of Primary schools was negative ones.

4. DATA AND METHODOLOGY

Secondary data has been used in this study for the period of 1972-73 to 2012-13. The data in this study have been acquired from various sources such as different Economic Surveys of Pakistan, Handbook of Statistics on economy of Pakistan and World Development Indicators. Data on GDP, IMR, GFCF and PSE has been abstracted from World Development Indicators. Data on ELF, EEI and CPI has been acquired from Handbook of Statistics on economy of Pakistan and Economic survey of Pakistan. Augmented Dickey-Fuller test and Johanson-Jeselius cointegration test have been utilized in our model to measure human capital formation and economic performance of Pakistan.

a) ADF Test

Augmented Dickey-Fuller test is most commonly used to measure unit root in time series analysis. The ADF test is used to calculate stationary values at Level, First Difference and Second Difference. When all the stationary values of Level with, intercept, trend and intercept are insignificant due to some positive stationary values and some negative stationary values then we calculate stationary values at First Difference. Because all stationary values at first difference will be negative at several stages of confidences in unit root test. For getting an unbiased estimate of δ , it is best to include enough lagged difference terms so that the error term in the following Equation is serially uncorrelated.

$$\Delta y_t = \alpha + \beta t + \gamma y_{t-1} + \delta_1 \Delta y_{t-1} + \dots + \delta_{p-1} \Delta y_{t-p+1} + \varepsilon_t$$

In the above mentioned model α represents the constant term, β presents the coefficient for a time trend and P shows the lag order of the autoregressive process. It describes that when the ADF test is pertained, the lag length p has to be calculated. After that we examine the unit root test under the null hypothesis $\gamma = 0$ against the substitute hypothesis $\gamma < 0$.

$$DF\tau = \frac{\gamma}{SE(\gamma)}$$

After the calculation of a worth for the test statistics it is matched up to the related estimation of the Dickey-Fuller test. The null hypothesis of $\gamma = 0$ is rejected, if the value of t-statistics are smaller than the critical value. It implies that there is no unit root.

b) Johanson –Jeselius Test

The Johanson cointegration test is presented by Johansen and Juselius (1990). This test is dependent on a vector

autoregressive model (VAR). Johanson-Jeselius technique is widely connected to test whether a group of non-stationary series is cointegrated or not. The Johansen cointegration test can examine a considerable measure of cointegration relations. All elements are viewed as endogenous and after that the test is not influenced by the decision of yield components and the variable being normalized. Therefore a VAR model manipulates all endogenous variables in the arrangement as a capacity of the lagged estimations of all the endogenous variables in the structure.

c) **Model Specification**

For this, GDP is used as dependent variable while ELF, EEI, CPI, GFCF, IMR and PSE are used as explanatory variables in our model to measure the economic performance of Pakistan.

$$Y = f(X_1, X_2, X_3, \dots, X_n)$$

Y represents the total output level and X represents the explanatory variables of the model. Our specified model with above mentioned variables is given as under:-

$$LGDP = \alpha_0 + \alpha_1(LELF) + \alpha_2(LEEI) + \alpha_3(LCPI) + \alpha_4(LGFCF) + \alpha_5(LIMR) + \alpha_6(LPSE) + \varepsilon$$

Where

LGDP = Log of Gross Domestic Product

LELF = Log of Employed Labour Force

LEEI = Log of Education Enrollment Index

LCPI = Log of CPI Inflation

LGFCF = Log of Gross Fixed Capital Formation

LIMR = Log of Infant Mortality Rate

LPSE = Log of Public Spending on Education

ε = Error Term

d) **Description of Variables**

Gross Domestic Product

Economic development of a nation is controlled by an increase in the extent of the economy of a country. A wide indicator to demonstrate the extent of an economy is its outcome. Different economists measure economic output of a country through its Gross Domestic Product (GDP). In this study, we have taken Gross Domestic Product as a dependent variable.

Education Enrollment Index

We will use "school enrollment ratio" as a proxy for human capital in our study. It measures the enrolled number of students in different classes. The education enrollment index is formulated by the sum of the enrolled number of students at different level divided by the population.

$$EEI = (5EDt + 8 EDt + 10 EDt + 16EDt) / \text{Population}$$

This indicator plays a vital role in the economic growth of the country. The growth of the country is positively correlated with the availability of the best schooling facilities. Barro and Lee (2000), Mankiw (1992) and Chaudhry I.S (2005) have used EEI as a proxy in his studies.

Gross Fixed Capital Formation

Gross Fixed Capital Formation determines the value of new or existing fixed assets purchased by the governments and households in the economy. Variations in this variable are considered to demonstrate something about future business activities and the layout of economic improvement. Ali S. et al (2012) analyzed the more a country has the capacity to save and invest out of given national income, the more prominent will be the development of that country income.

Public Expenditure on Education as % of Gross National Product

Gross National Product is very important indicator of economic growth. Aggregate public expenditure on education expressed as a percentage of the Gross National Product in a given monetary year. Ali, A. et al., (2012) showed the insignificant relationship between public expenditure on education and GDP due to minimum education budget as compared to other developing countries.

Employed Labour Force

Employed labour force is a key indicator of our model. All the employed persons who have jobs or business according to its ability, skill and qualification is called employed labour force. It is a key element for the creation of human capital formation. Reza, A. and Valeecha, S. (2012) explored the positive relationship between labour force and economic growth of Pakistan. Kakar, Z.K. et al., (2011) used labour force contribution as a proxy for labour.

Infant Mortality Rate

The infant mortality rate is estimated by dividing the total number of children dying under a year of age divided by the total number of children born in the that year. The Infant mortality rate is a very key indicator of health. It is used to measure the wellbeing of children and mothers. There is no doubt that health is directly affected by income level. Shehzada, S. (2004) showed the casual relationship between income and mortality. Good health increases the income level of the individuals while it is contrary to the other side.

CPI Inflation Rate

Inflation in Pakistan is calculated as the annual percentage change of the average consumer price index. Ali, S. et al., (2012) explored that the CPI inflation rate was very useful to avoid correlation problems in the model. Human Capital is used as an endogenous variable in growth and inflation methods. Sarel (1996) demonstrated that the CPI inflation rate was responsible to minimize the probability of negative correlation between inflation and growth rates.

5. Findings and Results

In Table 1 interprets the descriptive statistics, which consists of the values of mean, median, standard deviation, skewness and kurtosis. Table 2 represents the less, weak or strong degree of correlation among variables. We abstract the stationary values of all the variables by using Augmented Dickey Fuller (ADF) test. Then, we can apply Johansen and Juselius test to trace out the number of cointegrating vectors in the study. To measure the significant relation among variables for the long run, we use unrestricted co-integration rank test. In Table 3 has explored the existence of the long run relationship and the Table 4 represents the stability analysis of dependent variable LGDP with other explanatory variables LELF, LEEI, LCPI, LGFCF, LIMR and LPSE.

Table 1 Descriptive Statistics

	GDP	GFCF	IMR	PSE	ELF	EEI	CPI
Mean	4060740.00	546836.10	101.42	2.30	28.41	0.18	150.79
Median	1269123.00	240805.00	101.65	2.24	28.43	0.07	142.38
Maximum	22909079.00	2675235.00	135.40	3.02	31.15	0.90	233.24
Minimum	54058.00	6813.00	69.00	1.52	25.98	0.04	100.00
Std. Dev.	5887613.00	729421.40	20.15	0.38	1.53	0.21	36.68
Skewness	1.83	1.56	0.01	0.06	0.23	1.86	0.60
Kurtosis	5.42	4.23	1.71	2.27	2.04	5.55	2.30
Jarque-Bera	33.70	19.70	2.89	0.96	1.99	35.55	3.39
Probability	0.00	0.00	0.24	0.62	0.37	0.00	0.18
Sum	171000000.00	22967118.00	4259.50	96.70	1193.09	7.56	6332.99
Sum Sq. Dev.	1.42E+15	2.18E+13	16650.88	5.891758	9.55E+01	1.87E+00	55174.71
Observations	42	42	42	42	42	42	42

The table 1 reports different values of Mean, Median, Standard Deviation, Skewness, Kurtosis, Jarque-Bera and etc. of independent variables LELF, LEEI, LCPI, LGFCF, LIMR and LPSE. The (GDP) shows the Mean value (4060740) with Standard Deviation (5887613). The (GFCF) signify the mean value (546836) having a standard deviation (729421). The mean value of (IMR) is (101.42) with (20.15) standard deviation. The mean value (2.30) of (PSE) with (0.38) standard deviation has less contribution in (GDP). The mean value of (ELF) is (28.41) with (1.53) standard deviation. The mean value (0.18) of (EEI) with (0.21) standard deviation shows the significant impact on (GDP). The (CPI) indicates the mean value (150.79) having a standard deviation (36.68). It is obvious from the table 5.1 that the variables IMR, PSE, ELF, CPI having the values of kurtosis are less than 3 which shows the platy kurtic situation of these variables.

Table 2 Pairwise Correlation Matrix

	GDP	ELF	EEI	CPI	GFCF	IMR	PSE
GDP	1						
ELF	0.61	1					
EEI	-0.99	0.66	1				
CPI	0.25	-0.06	0.15	1			
GFCF	0.82	0.54	0.80	0.22	1		
IMR	-0.80	-0.19	-0.76	-0.34	-0.79	1	
PSE	0.02	-0.11	0.00	0.26	0.11	-0.25	1

Table 2 shows the pairwise correlation matrix among dependent and explanatory variables. The employed labour force (ELF) having value (0.61) represents the weak degree of correlation with (GDP). The education enrollment index having value (-0.99) shows the weak correlation with (GDP). The consumer price index (CPI) with (0.25) illustrates the less degree of correlation with (GDP). The gross fixed capital formation (GFCF) having a value (0.82) demonstrates the weak degree of correlation with (GDP). The infant mortality rate (LIMR) with (-0.80) shows a weak correlation with (GDP). The public spending on education (PSE) having a value (0.02) illustrates the less degree of correlation with (GDP).

Econometric Analysis

(i) ADF Test

Most importantly, the unit root test has been led for all the variables. Consequently, ADF test has been connected to verify the integration properties of the variables in the time series data is a first step. It is very obvious that the mean and variance of the data for the same period of time must be same to fulfill the characteristics of stationary.

Table 3 Unit Root Test

Test	Variables	Intercepts	Critical Values	Significance Level	Trends and Intercept	Critical Values	Significance Level	Conclusion
At Level	LGDP	-1.5406	-2.94	5%	-2.2450	-4.20	1%	Non-stationary
	LELF	-1.5584	-2.94	5%	-1.7233	-4.20	1%	Non-stationary
	LEEI	1.9320	-2.94	5%	-0.1569	-4.20	1%	Non-stationary
	LCPI	-1.6028	-2.94	5%	-2.2649	-4.20	1%	Non-stationary
	LGFCF	-2.1776	-2.94	5%	0.112	-4.20	1%	Non-stationary
	LIMR	2.5973	-2.94	5%	-2.2989	-4.20	1%	Non-stationary
At First Difference	LPSE	-2.0228	-2.94	5%	-2.6783	-4.20	1%	Non-stationary
	LGDP	-5.5342	-3.61	1%	-5.5826	-4.20	1%	Stationary
	LELF	-7.7594	-3.61	1%	-7.8354	-4.20	1%	Stationary
	LEEI	-2.8559	-2.61	10%	-5.6344	-4.20	1%	Stationary
	LCPI	-7.0412	-3.61	1%	-6.9466	-4.20	1%	Stationary
	LGFCF	-2.7059	-2.61	10%	-----	-----	-----	Stationary
	LIMR	-6.8597	-3.61	1%	-7.0360	-4.20	1%	Stationary
	LPSE	-5.1723	-3.61	1%	-5.1415	-4.20	1%	Stationary

Source: Author's Calculations

In table 3, we have reported the stationary results of seven variables. It is very clear that at level all variables are non-stationary but at first difference all variables are stationary. At this stationary level of variables, we can easily apply Johansen and Juselius cointegration test . The regression of this study will be free of error.

(ii) Johansen-Juselius Test for cointegration

It is obvious from the results of the ADF test at the first difference that we can apply Johansen and Juselius cointegration test. Table 4 represents the results of the Johansen - Juselius test which based on the Maximum Eigen (λ max) statistics and Trace statistics(λ trace). Both of these tests are used to trace out the number of cointegrating vectors.

Table 4: Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.73	205.20	125.62	0.00
At most 1 *	0.68	152.57	95.75	0.00
At most 2 *	0.61	106.42	69.82	0.00
At most 3 *	0.55	68.50	47.86	0.00
At most 4 *	0.38	36.55	29.80	0.00
At most 5 *	0.32	17.16	15.49	0.03
At most 6	0.04	1.86	3.84	0.17

Source: Author's calculations

The table 4 shows the cointegration among the variables and correlation sign of long run between the dependent variable GDP and other explanatory variables – ELF, EEI, CPI, GFCF, IMR and PSE.

The first column of the table represents the hypothesized value, the second column shows the Eigenvalues. Third column illustrates the trace statistics and the fifth column demonstrates the critical value at 0.05 levels. The sixth column represents the probability of these values.

It is obvious from the values of first six trace statistics are greater than the values of trace critical. All the trace statistics values such as 205.20, 152.57, 106.42, 68.50, 36.55, 17.16 are greater than trace critical 125.62, 95.75, 69.82, 47.86, 29.80, 15.49 values. Trace test represents the six cointegrating equations at the 5% level of

confidence. The last value of trace statistics 1.86 is less than the trace critical 3.84. The test assumes the Linear deterministic trend. Six cointegrating vectors exists according to trace (λ trace) stat. Table 5 shows the results of Maximum-Eigen statistics test which rejects the null hypothesis at the 5 percent level. The table 5 also represents the results of the unrestricted co-integration rank test. It is used to check the significant relation among variables for the long run.

Table 5: Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.73	52.62	46.23	0.01
At most 1 *	0.68	46.15	40.08	0.01
At most 2 *	0.61	37.92	33.88	0.02
At most 3 *	0.55	31.95	27.58	0.01
At most 4	0.38	19.39	21.13	0.09
At most 5 *	0.32	15.30	14.26	0.03
At most 6	0.05	1.86	3.84	0.17

Source: Author's calculations

Table 5 illustrates that first four values of Max-Eigen statistics are greater than the critical values. So Max-Eigen value with * in the above mentioned table depicts the four cointegrating equations at 5% level of confidence. Max-Eigen values 52.62, 46.15, 37.92, 31.95, 15.30 are greater than critical values 46.23, 40.08, 33.88, 27.58, 14.26. All these values show the rejection of hypothesis at 0.05 level. The Max-Eigen values 19.39 and 1.86 are smaller than critical values 21.13 and 3.84 which accept the hypothesis at the 5 % level of confidence.

(iii) **The Long Run Analysis**

The long run estimates are reported in table 6 that based on the cointegration analysis. We have explored the existence of the long run relationship among LGDP and LELF, LGDP and LEEI, LGDP and LCPI, LGDP and LGFCF, LGDP and LIMR and finally between LGDP and LPSE. We have found that the findings of the study are according to the theoretical expectations.

Table 6: Long Run Results

Explanatory Variables	Coefficient	Standard errors	t-statistics
LELF	0.44	0.66	0.67
LEEI	0.37	0.11	3.38
LCPI	-0.27	0.09	3.09
LGFCF	0.73	0.09	7.91
LIMR	0.07	1.02	0.07
LPSE	-0.41	0.12	3.30

Source: Author's calculations

The LELF has positive coefficient (0.4398) and is statistically insignificant which shows that one percent increase in employed labour force raises the economic growth about (0.44) percent. The reason may be that the more the employed labour force of the country would increase the economic growth. The value coefficient of LELF is insignificant but positive. The reason may be that the share of capital has increased as compared to labour because of intensive use of technology, adaptation of mechanization, more use of computerized technology and modernization. These things has made the use of labour insignificant.

The second variable is Education Enrollment Index (EEI) that has positive sign with coefficient (0.3662) and is statistically significant. It represents that one percent increase in education enrollment index raises the economic growth about (0.37) percent. The reason may be that with the improvement of education enrollment, the human capital formation becomes better and improved. With the enhancement of human capital formation the economic performance of Pakistan also increases. These results are in line with the findings of Barro and Lee 2000 ; Chaudhry, I.S 2005 ; Quddus, M.A. et al. 2010 ; McMahan 1998; Khilji, B.A. 2005; Kakar, Z.K. 2011; Khattak, N.U.R and Khan J.2012. So the results of this variable is highly significant.

The variable LCPI that has negative sign with coefficient (0.2699) and is statistically significant

which demonstrates that one percent increase in consumer price index decreases the economic growth by about (0.27) percent. The reason may be that in Pakistan the prices of commodities are increasing rapidly. The purchasing power of the people is decreasing day by day that reduces the demand for the product. Overall the output falls via reverse action of Keynesian multiplier- accelerator interaction and have negative impact on growth.

The fourth variable is gross fixed capital formation having positive sign with the coefficient (0.7277) and is statistically highly significant exploring that one percent increase in gross fixed capital formation raises the economic growth about (0.73) percent. The reason may be that a country has the capacity to save and invest more out of given national income, that further raises growth of output. The results are in accordance with Kakar, Z.K. et al., 2011; Ali, S. et al., 2012.

The next variable is the infant mortality rate having positive coefficient (0.0718) and is statistically insignificant. One percent increase in infant mortality rate raises the economic growth about (0.07) percent. The Infant mortality rate is considered a key indicator of health. There is no doubt that health is directly affected by income level. Although the sign is positive but insignificant, the value of coefficient is so small which has very minor influence on growth and is negligible. We have introduced the IMR variable in the model just for model specification. Ali, S. et al., (2012) discovered that health variable influence per capita GDP positively showed the casual relationship between income and mortality. Shehzad.S. (2004).

The last variable is public spending on education as % of Gross Domestic Product, which shows the negative sign with coefficient (0.4090) and is statistically highly significant at one percent level of significance. One percent increase in public spending on education reduces the economic growth about (0.41) percent. The reason may be that the government of Pakistan allocates a minimum amount for education in the budget. The results are well-matched with the studies of Khilji, A.B. 2005; Ojha, V.P. and Pradhan B.K. (1987); Reza, A. and Valeecha, S. 2012; Ali, A. et al., 2012. So the results of this variable are not according to our expectation.

(iv) Error Correction Analysis (Stability Condition)

In our econometric model error correction term represents the settlement of variables in accordance to acquire the equilibrium. Table 7 demonstrates the stability analysis of dependant variable LGDP with other explanatory variables LELF, LEEI, LCPI, LGFCF, LIMR and LPSE.

Table 7 Results of Stability

Explanatory Variables	C.I vector	E.C coeff	C.I vector E.C coeff	Significance (E.C)
LGDP	1	-0.27	-0.27	Significant
LELF	0.55	0.03	0.02	Insignificant
LEEI	-0.21	-0.51	0.11	Significant
LCPI	0.03	0.6111	0.02	Insignificant
LGFCF	-0.28	0.47	-0.13	Insignificant
LIMR	5.13	-0.00	-0.01	Insignificant
LPSE	0.69	0.06	0.04	Insignificant
			-0.22	

Source: Author's calculations

We use an error correction method to explore the stability condition. The sum of column 4 represents the negative result of the product of cointegrating coefficient and error correction, which fulfill the necessary condition of stability condition. The condition is satisfied with our study. The variable Education Enrollment Index (LEEI) has positive sign and significant in our study, if any shortcoming of long run exists in the model it will be coped up with LEEI.

6. Conclusions and Policy Recommendations

The basic theme of the study is to measure the economic performance of Pakistan due to human capital formation. Secondary data has been used in this study for the period of 1972-73 to 2012-13. The ADF test, cointegration test and Johansen Juselius approach were applied to abstract the empirical results. The study concludes that the human capital formation and related variables are found very significant. A gross fixed capital formation having positive sign with the coefficient (0.7277) and is statistically highly significant exploring that one percent increase in gross fixed capital formation raises the economic growth about (0.73) percent. They have desirable influence on economic growth.

On the basis of analysis the following policies have been recommended.

- The government should increase its education budget for that specific financial year.
- The government should encourage the education enrollment at different levels.
- The government should promote research and development sector through HEC.
- Political will and commitments towards the education sector should be improved.
- The government should encourage public and private coordination for technological development.

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