Examining the Relationship between Literacy Rate and Poverty in Pakistan

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Abstract

Education plays an important role to pave way towards economic growth. Investment in education enhances the living standards and it is necessary for economic growth and social well-being of a society. This study forecasted the education status and its impact on economic growth by taking data from 1971 to 2016 in Pakistan. Secondary data were taken from International Finance Statistics and World Bank Development Indicators. The variables included in the research were poverty, Education status, and Economic growth. Time series analysis was carried out on the data. The empirical methodology adopted for this purpose includes the use of Augmented Dickey Fuller test, WALD test, Johanson cointegration test, and VECM test. The study found long-run relationship between economic growth and the education status when poverty serves as dependent variable measuring economic growth in case of Pakistan. This showed that education does affect economic growth in the long run but not in short run. The interdependency between the variables suggested that policies should be formulated that would have a long lasting positive impact on the education status of the population and the continuity of the policies to achieve its objectives is more essential.

Keywords: Literacy Rate, Poverty, Economic Growth, Education Status

1. Introduction

Education is a human right and provides the foundation on which individual and collective cultural identity can develop. Education is essential for sustainable human development and for enabling people to live together in peace. Every child has the right to school education and every adult has the right to meet his or her basic learning needs. Every religion has laid stress on the importance of education and learning. Increasing literacy rate is the main area of concern and need of the present time. The definitions of literacy may vary from country to country. According to the most acceptable definition presented by UNESCO, adult literacy is defined as;

"Literacy rate is the percentage of people ages, 15-24 who can, with understanding, read and write a short, simple statement in their everyday life."

Education affects the growth in society both directly and indirectly. The direct effects include imparting of knowledge, skills and training that is linked to higher wages. The indirect or external effects include accomplishment of basic needs, higher levels of autonomous participation, greater utilization of health facilities, shelter, water and other basic necessities that help to achieve fertility, family abundance and health. The relationship between education and poverty can be examined by the analysis of rates of returns by education and production function analysis at all levels. Improving comprehensive educational provision, attainable to poor women, involves reprioritizing expenditure patterns in the sector, with added allocations to basic education as well as non-formal, adult education set-ups and pre-school education. Spending at college levels should be appropriate for promising greater enrolment for female students. Attainable amount reviews should cover an analysis of educational spending from a gender point of view and outcomes can be observed by using gender-disaggregated benefit incidence analysis (Jeffery, 1996).

Many researchers have highlighted the effect of education as accelerating economic growth. Poverty rate goes down with the increase in literacy rate. Poverty is more concentrated in illiterate households in developing nations. For example, in Pakistan, nearly all the poor are uneducated and unskilled. Previous literature suggested that illiterate and unskilled population remains poor and on the other hand, the educated nations can never be poor. The indirect relationship between poverty and education was found in middle school graduates and illiterate individuals (Graham, 2002). Similarly, Tether (2005) found an inverse relationship between poverty and education in case of India. Lower literacy rate hinders progress in developing countries. The illiterate and unqualified population tends to migrate to other countries in search of better opportunities. This can be summarized by understanding that poverty is absent in educated households and its presence is noted in illiterate households (Tether, 2005).

The role of education in empowering the poor has been over looked over the past few years and this is apparent from the literacy rate of the region. Because education is considered unimportant for poor as they have major survival issues. The upper class notion that accessibility of education to poor would be against the benefits and well-being of the well-to-do, influential and rich people, also leads to deprivation of education to the poor. Furthermore, many researchers concluded that elite are against the idea of educating the poor as they get empowerment and awareness of their rights. Moreover, an inverse relationship between child mortality rate and female literacy rate which is a major poverty indicator has been observed. It is evident from many studies that child development and female literacy rate are significantly associated to each other (Khan, 2009).

The global education is a major factor in decreasing gender biasness in education and thus, eradicating poverty and giving more socio-economic benefits. Strong gender discrimination in education is evident in South Asia. The female average school life expectancy is 8 years whereas the male school life expectancy is 10 years. The social benefits of female education are far more than those of male education and this is clear from many past researches. Child mortality rate can be reduced up to 15% just by increasing a single year of education of mothers. This shows that female education can change the status of any nation and put it on the road to success (Katarina, 2005).

There are three major effects of poverty on education status. First effect is from the financial side, second is the social stress faced by the poor students, and last is the deterioration of educational standards due to poverty. Broadly speaking, usually poor countries have lower literacy rates and at individual level also, the poor children have lesser access to quality education. Out of more than 6.5 million children, about 80% of them have never been to school in Pakistan. Economic and non-economic constraints of these high figures include child labor and gender discrimination in education. Incomplete knowledge of religion is also a major barrier to education particularly among females. Unfortunately, Pakistan has the second highest number in the list of out-of-school children, where more than 60% population lies below national poverty line. It is evident that income and education poverty have strong bidirectional relationship at individual and national level (Special, 2008).

2. Literature Review

Farooq (2015) highlighted a few major components of health and education for reducing unemployment in long term as well as short term period of life. The researcher included cointegration tests on time series data from the time period 1972-2010 in Pakistan. He applied VAR and VECM techniques on the data. The results showed that educational

spending, total number of enrollment in school, healthcare spending, gross fixed capital development, and total number of hospitals were the major components in reducing unemployment in case of Pakistan. The findings confirmed that by including 7% yearly changes in short run measures, long term equilibrium could be achieved. More spending on education was recommended at primary levels and vocational training programs by giving loans and grants to students. Similarly, increased health spending would have a significant and positive impact on overall health of the country's population (Farooq, 2015).

Sattar (2012) undertook sociological observations of scattered variables; for example, cost of learning, squat enrolment rate, urban rural disparities, adult literacy, lack of concerns of parents, and huge drop out ratio in the sector of educational structure. The researcher analyzed the schools associated with Board of Intermediate and Secondary Education (BISE) of Multan district in Pakistan. Both secondary and primary data was taken from Human Development Centre (HDC), Economic survey of Pakistan, and by interviews respectively. The researcher concluded that decentralized management, assessment system, and expensive education are a major element that affects the basis of education sector in the country. She recommended sufficient organizational facilities, strong strategies, equity and consistency in educational sector, strong and plentiful involvement of stakeholders to decrease damaging effects of the variables (Sattar, 2012).

Mursa (2007) examined the positive association between level of education and the level of employment. It was found that the main reasons of unemployment were; lack of abilities, education, skills, and awareness. The researcher stated that economic growth was directly related to education because it enhanced productivity. It was concluded that less educated work force were not preferred by employers because of lack of knowledge and skills. The author further concluded that more qualified employees had cooperative benefits over less educated ones and they were being offered high salaries and compensation packages by the employers. Moreover, many organizations preferred high qualified people as they were more knowledgeable and higher qualification increased the probability of employment (Mursa, 2007).

Abbas (2008) examined the effect of education level on income in Pakistan. The researcher took cross sectional data of Pakistan for the years of 1998-2004. Under-education was considered as a temporary phenomenon. The results concluded a correlation between work experience and level of education which stated that more qualified people had little experience. It was further concluded that male workers had higher salaries when measured with the help of mean and mode index as compared to the female workers that means more qualified male workers had comparative advantage over the others in the job market of Pakistan (Abbas, 2008).

Okubal (2005) examined the role of Government spending on education on economic development and human capital. The researcher took secondary data from Uganda and applied econometric techniques like Error Correction Method (ECM), Cointegration and time series modeling. Human capital was measured by average years of education. The results concluded a direct and significant association among the variables in long as well as short run. The author recommended that increased government spending on education sector would enhance the educational quality because evidence of research showed that both government spending on education and educational quality were positively related. It was recommended that private sector should be encouraged to invest in the educational sector to contribute in the pace of economic development (Okubal, 2005).

Adefabi (2005) investigated the interrelation between economic growth and education in long run by employing econometric modeling. The author used secondary data over the years 1970-2003 from Nigeria. Methodology involved the application of Vector Error Correction Method (VECM) and Johansen cointegration test. The results showed that economic growth could be affected by human capital in two ways in case of Nigeria. Firstly, it could have direct effect on productivity and secondly, it was found sensitive to technological parameters. The results of Johansen cointegration test confirmed a significant relationship in the long run between the variables. The researcher suggested that a skilled and well informed labor force had more contribution on the productivity function which consequently had a positive effect on the total output level of the economy (Adefabi, 2005)

Kazmi (2005) argued that advantages of globalization could be accomplished by expertise and learning. Better standard of education and learning improves social and economic area of society and also gives the citizens access to information and productivity. Advancement of basic education should be the most crucial element for the advancement of educational programs in developing countries. Both mental and physical health played the most important role in human uplift. It was suggested that investment should be encouraged by the public sector in higher educational sector but at the same time, proper monitoring should be followed to approve national program (Kazmi, 2005).

Psacharopoulos (2004) studied the yield on educational spending. The researchers discussed that there many forms and estimates of return to educational spending in previous period. They checked educational return on nearly 98 countries. It was found that social rate of return on education is less than private rate of return. Investment of human capital and physical capital were found to be similar to investment on education. Time series econometric models and estimation techniques supported human capital theory. The authors said that mostly benefits of school education are good measure of growth and enhancement of intellectual capacity.

They discussed modern forms and assessments of investment in educational sector and concluded that return on education motivated individuals to invest in their human capital. It was suggested that policy makers should pay attention in making the strategies to encourage spending on education from middle income group. They further suggested that return on educational investment on micro level is comparable while this is not possible at macro level. The researchers recommended that further investigation is required on social rate of return to education that would stimulate reform financing instrument and more research is needed on the effect of education on income by including quasi experimental model in developing countries (Psacharopoulos, 2004).

3. Problem Statement

With reference to the previous studies, it can be said that education has an impact on economic growth. To analyze this statement, the literacy rate of Pakistan is forecasted. Education stimulates the economic growth by reducing poverty, increasing employment opportunities, and improving standard of living. Education is an important measure to enhance economic growth. Education attainment faced gender discrimination and was being neglected in the past. Education helps to address many issues like poverty, illiteracy, low economic status and is a road to development. It is the basis of economic wealth, social prosperity, and political stability.

This study helps Pakistan to make progress in the education sector and facilitates in making the better plans in this context. The study helps the policy makers of these nations on how to accelerate Economic growth and its implication on common man by analyzing the relationship between growth and adult literacy rate. Instead of cross-county regressions, this study will apply a time-series analysis to investigate the contribution of education development to economic growth on time-series data of Pakistan.

4. Objectives of the Study

The objectives of the study were;

- To study the short run relationship between Poverty and Literacy rate.
- To study the long run relationship between Poverty and Literacy rate.

Hypothesis

1. H_1: Poverty and Literacy rate have short run relationship.
2. H_2: Poverty and Literacy rate have long run relationship.

This study was designed to investigate the relationship between economic growth and education status. The data consists of two major variables including education status as Adult literacy rate above 15 years of age and population below national poverty line measuring the economic growth (all measured in percentage) of Pakistan. Secondary data were

taken for the period of forty two years i.e. 1971 – 2012. Data has been extracted from "The World Bank Indicators", "UNESCO institute of statistics UIS" and "IMF" economics data sources websites. The software used for the analysis of the data is Eviews and SPSS. At first, data was checked for stationarity and later, on Johansen cointegration test, VECM and WALD Test were carried out and interpretations of results was done. In the end, results were analyzed followed by a brief comparative analysis of Pakistan.

5. Theoretical Framework

Education in its widest sense is the source through which the targets and traditions of a cluster of people's lives transmits from one generation to the following generation. Usually, it happens through some acquaintance that has a determinative aftereffect on the manner one ponders, senses, or acts. In its narrow sense, education is the academic action by which association advisedly transfers its collected information, skills, and ethics from one generation to the next, e.g., apprenticeship in institutes. This theoretical framework helps to understand the impact of poverty theories on the education status (Oxaal, 1997).

Most of the previous researches including poverty and literacy rate have checked whether education brings monetary benefits or not. Most of the experts agree that level of education has positive relationship with the level of economic growth. But there is ambiguity about the direction of causality due to the fact that whether education reduces poverty and enhances economic development or the later give rise to education, is still a fact to be known.

5.1. Education in Economic Theory

After the Second World War, economic development emerged as a separate discipline of economics. Initial theories were the continuation of classical economic theory, which postulated that development takes place due to the industrialization and growth. But the modern concept of economic development considers education as an important contributor in development and it has been believed that continuous and long-term investment in the human capital exerts positive impact on social and economic development directly by improving the current knowledge and by creating new knowledge and skills and indirectly by reducing the financial allocations for judiciary, health, social protection, etc (Osmankovic, 2011).

Theoretical Framework of Interdependence: Education vs. Development

In second half of the 20th century, the focus of economic theories changed from accumulation of physical capital to need for investment in human capital. This highlighted the importance of education and different

forms of training (additional training, etc.) as a prerequisite for growth. The importance of education for economic development has been highlighted in concepts of human capital, human development, and approach to returns on investment.

Human Capital Theory

The concept of human capital was first introduced around 1691 by Sir William Petty. Later, it was discussed by Adam Smith (1776), Jean Baptiste Say (1821), Irving Fisher (1897), John Stuart Mill (1909), William Roscher (1878) and Henry Sidgwick (1901). Many other researchers recognized this concept but shied away to treat people in the same way as the physical commodities which has been termed as "sentimentalism."

Adam Smith (1776) defined "the acquired and useful abilities of all the inhabitants or members of the society," as "human capital," considering it as one of the four types of fixed capital that lead to production in a national economy.

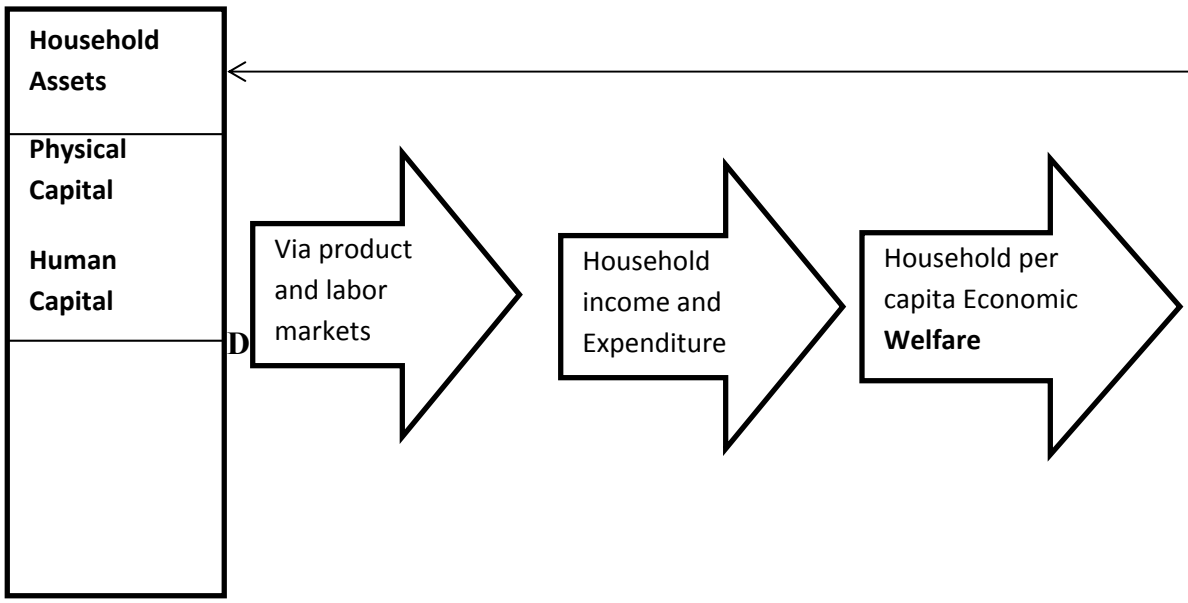
Human capital is a term that shows the stocks of skills, knowledge, and other characteristics that can be utilized to increase the productivity. Putting differently, human capital shows the efficiency of the unit involved in working hours. Given the impact of competences, education, skills and productivity, it can be assumed that individuals will invest in education in the same way as companies invest in their own physical capital.

Schultz (1993) and Danison (1962) have studied education in the context of Solow's residuals and described that education has direct impact on the growth of national income through increased skills, knowledge and overall capacity of the workforce. According to Schultz (1993), human capital is a good whose value depends on five categories of investment in people i.e., Health, including nutrition, migration, on-the-job training, formal education, and study schemes for adults. Schultz argues that people are national wealth and investment in the human capital is the basic reason behind differences in national income (Schuartz, 2010).

Human Capital Theory (associated with the research of Gary Becker, Mark Blaug, and many others) emphasized that education creates abilities which facilitate higher levels of productivity. Education is costly but it brings accompanying allowances which can be compared with its costs in the same way as with any investment project**.** Human capital theorists use proxy affirmation of various kinds in favor of the above discussion. First, there is a strong, and empirically confirmable, positive association between the wages that employees get and the levels of education, they have received**.** Using the normal assumptions of equivalent labor and goods markets, it follows that those with higher levels of education, have higher levels of productivity. Managers use educational features as a proxy for the suitability, and possible productivity of their employees (Popoola, 2007).

Human capital theory links education and poverty in agreement that poverty is reduced by education or education can help in the betterment of status, financially and otherwise also. Both poverty reduction and the achievement of Education for All feature prominently among the Millennium Development Goals (MDGs). There are sound intuitive, theoretical, and empirical reasons to believe that certain synergies exist between them, rooted partly in the neo-classical human capital theory (Schultz, 1961; Becker, 1964). The greater prevalence of poverty among the less well educated is indeed a pattern which may be found in every context, but nevertheless the relationships between education and poverty are complex and contingent. It is well established in developing countries contexts that household welfare levels are a key determinant of children's school enrolment, completion and attainment. Equally, household welfare levels are strongly associated with the human capital assets of household members, most particularly their educational attainment. Figure summarizes some of the key linkages between education and economic welfare. The relationships between household human capital stocks, household welfare levels and household investment in human capital (in the form of the decision to enroll children in school) play a central part in the intergenerational transmission of both privilege and poverty. Understanding these empirical issues is therefore crucial for education policy makers and is central to the research agenda of CREATE (the Consortium for Research on Educational Access Transitions and Equity) (Colclough, 1982).

Figure1: Examples of linkages between education and economic welfare



Secondary data were collected from World Bank and UNESCO institute of statistics. Poverty rate was used as an indicator to show economic growth which is served as dependent variable while adult literacy rate measuring the education status was taken as independent variable.

5.2. Target Population

Target population of the study includes Pakistan. The reason of selection of this country is that Pakistan has certain social and economic issues including those related to education and poverty and it is an important country of SAARC that has distinctive characteristics, which are very prominent and are of significant importance. SAARC is the largest geo-economic block of the world. Its population is 1.2 billion. Its combined average of GDP growth is over 7%. Its consumer base is over 425 million people in the middle class bracket. Its eventual contribution to the ever evolving global economy is tremendous. It has one of the most ancient living civilizations in the world.

6. Research Methodology

This section includes the entire procedure and methods through which the research objectives were achieved. SPSS and Eviews software were used for the analysis of econometrics results. The time series econometric procedure was conducted in the following order.

Stationary and Non Stationary Series

Firstly, test of stationarity of the series or their order of integration was carried out. A stationary time series is one whose statistical properties such as mean, variance, autocorrelation, etc. are all constant over time. Most statistical forecasting methods are based on the supposition that the time series can be rendered approximately stationary (i.e., "stationarized") through the use of mathematical transformations, such as using the Dicky-Fuller unit root test.

Unit Root Test

Unit root test was carried out to investigate any probable stationarity in a given time series with the help of autoregressive model.

Unit root process is given by:

$$Y_t = \rho Y_{t-i} + \varepsilon_t \qquad -1 \leq \rho \leq +1$$

Where ε_t shows white noise error term. If ρ = 1, then above equation can be written as:

$$Y_t = Y_{t-1} + \varepsilon_t$$

It shows random walk model without drift that is component of non-stationary stochastic process. Hence if the forecasted value of ρ is equal to one then Y_t becomes non stationary. This is common concept of unit root test of stationarity (Dickey & Fuller, 1979).

Dickey Fuller Test

This test is used for checking whether the certain kind of time series data has an autoregressive unit root. This test is widely used in many researches to test the Stationarity of any process. Consider the following three different kinds of random walk process:

$\Delta Y_t = \delta Y_{t-1} + \varepsilon_t$ Y_t represents random-Walk.

$\Delta Y_t = \beta_0 + \delta Y_{t-1} + \varepsilon_t$ Y_t represents random-Walk with drift.

$\Delta Y_t = \beta_0 + \beta_1 t + \delta Y_{t-1} + \varepsilon_t$ Y_t represents random-Walk with drift and trend.

Where 't' represents the time or trend variable. In all the above cases, the null hypothesis is that there is a unit root, $\delta = 0$, $\delta = \rho - 1$, it means that there is a unit root and there is non-statinarity in time series. The alternate hypothesis is $\delta < 0$, i.e. time series is stationary whereas, the probability of alternate hypothesis i.e. $\delta > 0$ is cancelled out because in this case ρ >1 which is not possible (Dickey & Fuller, 1979).

The Augmented Dickey Fuller Test

The monumental work on checking for a unit root in times series data has been done by Dickey and Fuller (Dickey & Fuller, 1979). It is continuity of Dickey Fuller (DF) test which eradicates all the structural aftereffects of autocorrelation in given time series. ADF test is used to check the complex set of time series models. The ADF value, incorporated in the test gives a negative figure. If the value of ADF is negative then the hypothesis is rejected and the presence of unit root is concluded at some level of significance. The model is:

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

α is constant, β represents time trend coefficient while p is lag order of autoregressive process.

Applying $\alpha = 0$ and $\beta = 0$ refers to estimating random walk**,** while $\beta = 0$ refers to estimating random walk model with drift.

Cointegration

It can be defined as:

Given a set of I (1) variables {x1t , . . . , xkt}. If there exists a linear combination consisting of all vars with a vector ¥â

So that

¥â1x1t + . . . + ¥âkxkt = ¥â

¡Çxt . . . trend-stationary

¥âj .= 0, j = 1, . . . , k. (Trend-stationarity means that after subtracting a deterministic trend the process is I(0).) Then the

x¡¯s are cointegrated of order CI(1,1).

¥â¡Çxt is a vector of (trend-) stationary variables. (Osterholm, 2007)

Johansen Cointegration Test:

To find out long run relationship among poverty and independent variable, Johansen Cointegration test was carried out which shows the

long run relationship among variables and if the cointegration is confirmed in the model, the residuals from the equilibrium regression can be used to estimate the error-correction model VECM. Stationarity properties will be analyzed as Engle and Granger (1987) pointed out that even if two variables are non-stationary and cointegrated, standard Granger causality test results will be invalid. However, standard Granger causality test will be valid if there will be no cointegration among the variables. And if they are non-stationary and cointegrated, "vector error correction model (VECM)" will be used for examining the causal relations; else, a "vector autoregressive (VAR)" model will be applied in the case of no cointegration among variables (Harahap, 2012).

VAR or VECM Model

To get to the opinion where we might consider using a VECM model as the basis for the causality testing, we have to go through the initial step of testing for cointegration. If there is no cointegration then we use VECM model. We reject the hypothesis of "no cointegration" would we even consider estimating a VECM model. This is a typical example of "preliminary test testing". That is, the framework (model) chosen as the basis for the non-causality test is dependent on the result of a previous test - a test for non-cointegration. So, one important question that arises is the following one:

If we first test for non-cointegration, and then (conditional on the outcome of this test) we perform another test, here are the properties of this second test:

The second test (the test for non-causality) will be of one form if we choose to use the VAR and of a different form if we decide to use a VECM. When we pre-test, the second test is actually a random mixture of two tests. The actual test statistic is a weighted sum of the test statistic that would be obtained if we used a VAR model, and the test statistic that would be obtained if we used a VECM model. And the weights are random, with values that depend on the properties of the prior (non-cointegration) test. While testing for no cointegration, decide on a VAR model or a VECM model.

In particular, there will almost certainly be some distortion in the significance level (and hence the power) of the final test. We may think we're applying the non-causality test at the 5% level, but the true significance level (the actual rate of rejection of the null hypothesis when this hypothesis is false) may be quite different. And this might cause inconvenience to us.

The VECM integrates the information about the short-run relationship; tests conducted within that framework may be more powerful than their equivalents within a VAR model (Gujrati, 2004).

WALD Test

The WALD test (F-statistic) is calculated to find out the short-run relationship between the variables. The Wald test can be carried out by imposing limitations on the expected short-run coefficients of poverty rate and Adult literacy rate. The null hypothesis and alternative hypotheses are stated below:

Ho: There exists no short-run relationship between literacy rate and poverty in Pakistan.

Against the alternative hypothesis

H1: There exists a short-run relationship between literacy rate and poverty in Pakistan.

The calculated value of F-statistic will be assessed with the tabulated critical values. In accordance to these authors, the critical values with lower bound supposed that variables are integrated of order zero, 1st difference or 2nd difference. So, if the lower bound value is more than calculated F-statistic value, then the null hypothesis is accepted and we conclude that there exist no long-run relationship between education variables and poverty (Zapata, 1997).

7. Results and Discussion

A non-stationery series has a unit root. This research uses Augmented Dickey Fuller (ADF) unit root test which is most effective among the tests for stationarity examination (Cheung, 1995).

Ho: Variable has a unit root or it is not stationary.

All the variables got stationery at first difference with trend and intercept.

$$\Delta Pt=ß1+ß2t+\delta Pt-1+\sum \Delta Pt-i\ \alpha i+et$$

If the p value is lower than 5% or critical value is less than test statistics then, the rule is to reject the null hypothesis Ho. For percentage of population below national poverty line, the absolute test statistic value 6.15 is greater than critical values and p value is 0.00% so Ho is rejected because p value is less than 5% and it is concluded that the variable got stationary at first difference (Weshah, 2003).

The model for Adult Literacy Rate is:

$$\Delta Lt=ß1+ß2t+\delta Lt-1+\sum \Delta Lt-i\ \alpha i+et$$

For percentage of Adult Literacy rate 5.33 is absolute t-statistic value which is greater than critical values and 0.0005% is the p value that is less than 5% so Ho is rejected and it is concluded that at first difference the variable got stationary.

Poverty rate is taken as a dependent variable p and adult literacy is the independent Variable. To find out long run relationship between the variables, Johansen cointegration test was used. Firstly, to check the presence of stationarity in data unit root test was applied. Both variables got stationary at 1st difference. It should be kept in mind that the entire variable must be integrated in the same order.

Table 1 - Unit root test

	Test critical values: (5% level of sig.)	t-Statistics	Prob.
Unit root Test for P		-6.155705	0.0000
	5% level	-3.526609	
Unit root Test for L		-5.339157	0.0005
	5%	-3.526609	

To determine the number of cointegration relationships, the Johansen approach on to cointegration was applied. The number of roots can be checked by trace statistics and max Eigen values. Trace statistics are estimated to determine the number of cointegrated vector in the model. The null hypothesis was:

Ho: There is no cointegration among variables.

The first column is the number of cointegration relations under the null hypothesis, second column is the ordered Eigen values of the model, the third column is the test statistics and the last two columns are the 5% critical values. If p value is lower than 5% or critical value is less than t-stats then as per rule Ho was rejected.

From the table, trace statistics 27.4 is greater than the critical value 20.2 with p value 0.004. This result shows only one cointegration equation at 1% level of significance. Since p value is lower than 5% and trace statistics is greater than critical value so Ho is rejected. It means that there is cointegration among variables that shows long run relationship between poverty and literacy rate.

Table 2 - Johansen's LR equation of Pakistan

P	L	C
1.000000	0.546822	29.62658
	(0.27760)	(10.6705)

$$p = - 0.54L$$

This shows that 1% change in p leads to 54% change in L in the opposite direction. The value in the parenthesis shows the respective value of coefficients.

To find the short run relationship among poverty and education, VECM is applied.

In equation (1), there are six coefficient, C (1) shows error correction terms which is one period lag residual of cointegrated equation and its negative sign shows that it is not significant as p value is less than 5% that

means that there is long run causality from education to poverty. C (6) shows the constant or intercept. The probability of coefficient of first order difference of poverty rate (0.06) is statistically insignificant at 1% level of significance. This negative sign shows that it has a short run impact on literacy rate. The coefficient of error correction term is equal to -0.18. This indicates that about 18% of variations would be adjusted with in the period of one year.

WALD test shows short run causality from education to literacy

Independent variables educations are C (4) and C (5).

Ho: C (4) = C (5) = 0

The results of WALD test show p value is 96.5% which is greater than 5% so Ho is accepted. This means that no short run causality exists between poverty rate and education status and jointly they do not effect economic growth.

Table 3: WALD Test

Test Statistic	Value		df	Probability
t-statistic	0.043424		33	0.9656
F-statistic	0.001886	33)	(1,	0.9656
Chi-square	0.001886		1	0.9654

7. Comparative Analysis

Education has positive and significant impact on economic growth. Human capital plays an important role in enhancing the economic growth as it generates the employment facilities and helps in reducing poverty level. It improves the standard of living and in a nutshell, it increases the overall growth of an economy. Afzal et al. (2010) supported this argument and investigated the linkages between education, poverty and economic growth in Bangladesh, India, Pakistan and Sri Lanka. The researchers confirmed positive relationship between education and economic growth, while poverty was found to be inversely related to economic growth. Chaudhary and Rehman (2009) also confirmed the negative but insignificant relationship of economic growth with Poverty. Afzal et al. (2012) also found that Education affected the economic growth positively and significantly while poverty and economic growth were negatively related with each other. Permani (2008) and Kakar et al. (2011) confirmed

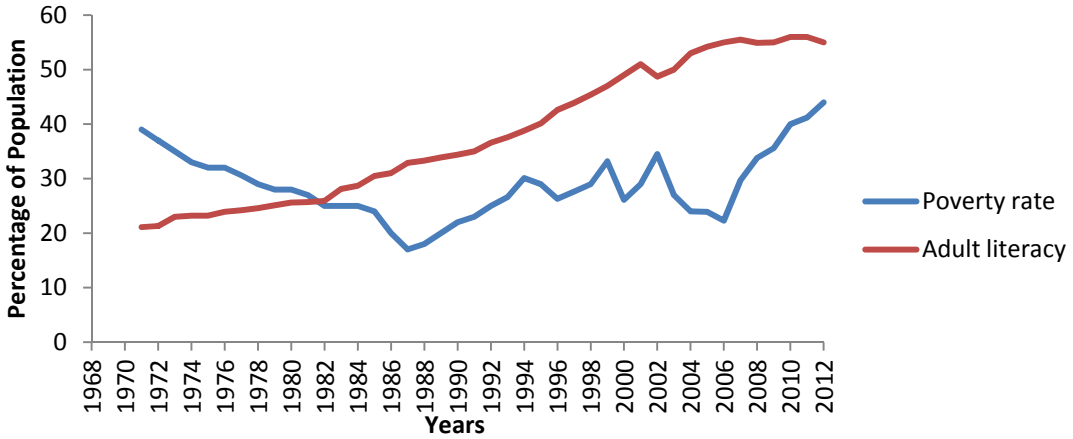
positive and long run relation of education with economic growth (Afzal et al., 2012).

Reham and Peng (2012), Chaudhary et al. (2009), and Islam et al. (2007) investigated the connection between economic growth and education. All the researchers verified the presence of long run relationship among the variables. According to Reham and Peng (2012), and Chaudhary et al. (2009), unidirectional causality existed between the variables that run from economic growth to education while Islam et al. (2007) and Barro and Lee (2012) found bidirectional causality between education and economic growth.

Many researchers found significant and long run relationship among school education & higher education with economic growth while Afzal et al. (2010) found the inverse relationships between school education and economic growth. Moreover, the researchers also confirmed direct relationship between school education and economic growth and inverse relation between poverty and growth in the Long run.

The Adult literacy rate in Pakistan showed increasing trend. It rose from 37.8 % in 1995 to 55% in 2011. Similarly, in Bangladesh, literacy went from 38% to 58% from 1995 to 2011. India made progress in education sector too. Its literacy rate went up from 52% to 63% over the years 1995-2011. In case of Sri Lanka, the literacy rate showed significant development. Its literacy rate went from 90% in 1995 to 98% in 2013 (CIA World Fact book, 2011).

Figure2 - Graph of P and L



8. Conclusion

The research concluded that just by increasing public expenditure on education without focusing on poverty reduction and literacy rate is not enough to achieve education status and economic growth. Pakistan has certain social and economic issues including those related to education.

Availability of education is the way to increase literacy rate in the region. Taking into account the lack of resources, all governments must consider allocating more funds for education. Until now, all these countries have been supporting their education sector from public funds whose percentage is very low that is between 2% and 4% of GNP. As there is clear evidence that education can lesson poverty but it is just one of various factors that hinder the availability of education. In order to decrease poverty rate it is important not only to enhance access to education but also to highlight the importance of education. Moreover, there is primarily great advantage of focusing on female education in the region.

Poverty is just one of the basic factors restraining learning through education. On the other hand, it is essential to open adequate schools in rural areas, to provide adequate funds. Regional collaboration in education would enhance the pace of progress. Education is critical for poverty reduction and improvement in standard of living. The main area of concern is to get things better and get rid of poverty.

The findings of the research suggested that public as well as private sector should pay due attention on the short as well as long run solutions of poverty elimination. The study also recommends pro-poor growth and education in Pakistan.

Before proceeding to testing for cointegration, unit root tests were performed using the ADF. The reported t-values resulting from the ADF indicated that the underlying series appear to be stationary at first differences. The Johansen cointegration confirmed the absence of a strong and stable long-run relationship between the variables in the model. The cointegration results confirmed the presence of Long run (LR) relationship between education and economic growth, when poverty serves as dependent variable measuring economic growth. Education affects Economic Growth positively and significantly only in LR. High literacy rate could be an effective way for reducing poverty and enhancing economic growth in the Pakistan. Poverty and Education are inversely and significantly related.

Table 4: Results of Pakistan

	Test critical values: (5% level of sig.)	**t-Statistics**	**Prob.**
Unit root Test for P			
		-6.155705	0.0000
	5% level	-3.526609	
Unit root Test for L			
		-5.339157	0.0005

	5%	-3.526609	
Johanson Cointegration Test	20.26184	27.49368	0.0042
VECM Test	C(1)	-1.884636	0.0683
WALD Test		0.043424	0.9656

Adult literacy rate was statistically significant in the model. Adult literacy rate was observed to have a bi-directional relationship with poverty in the region. Low literacy rates, poor facilities, inadequate education, high dropout rates, and insufficient funding in education sector are some of the most vital difficulties faced by these three countries. Additional funds are important but it is also mandatory to check whether these are being used most effectively and efficiently. Along with the quality education, many other things are essentially required like firm passion, stable political and economic conditions and of course, some good fortune.

9. Practical Implications

Education has powerful impact on the growth of any nation. School dropout rate can be reduced by lowering the cost of schooling for example; by eliminating school fees or giving scholarships to attend the school. In circumstances of floods and other natural disasters, educational facilities should be re-established as quickly as possible because it is basic way of re-establishing normalcy. Extraordinary efforts should be made to educate underprivileged groups such as females, cultural minorities and rural residents, disabled persons, and street children to increase literacy rate and ultimately, economic growth.

Growth should be measured by education status and poverty reduction because generation of income and employment are crucial for economic growth. This issue can be further addressed through microfinance and social safety nets. It is further recommended that the association between economic growth and poverty should be explored in the presence of macroeconomic variables such as physical capital.

The study also recommends pro-poor growth and education in Pakistan. Growth in Pakistan must be translated into education enhancement and poverty reduction activities. Growth and education that generates income and employment for the poor of the country can be critical for poverty reduction. Poverty can also be reduced by introducing social safety programs to the lower socio-economic segment of Pakistani society.

The interdependency between the variables suggests that policies should be formulated that would have a long lasting positive impact on the education status of the population. Accomplishment of a full course of primary schooling is mandatory to achieve universal primary education. Millions of children start school but finally drop out. In these countries, school systems are continuously underfunded and they lack sufficient funds so they are unsuccessful in providing better facilities. Expenditure on education is crucial for economic growth. Education helps in Poverty reduction and economic growth individually as well as collectively.

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