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Research Article

# Education, poverty and economic growth in Pakistan

Muniba Aqeel[1]. Saima Shafique[2], Fareeha Raiz[3], Syed Arshad Ali Shah[4]*

[1,2,3]Department of Economics, NUML Islamabad, Pakistan
[4]Department of Management Sciences & Commerce, Bacha Khan University, Charsadda, Pakistan

*Corresponding Author email: arshad@bkuc.edu.pk

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## ABSTRACT

Development of any nation depends upon the education. Education is a process which helps us to enhance the productivity as well as help us to reduce the poverty. Poverty, education and economic growth have a strong link. In the context of Pakistan, this analysis uses time series data on education, poverty, physical capital, and economic growth from 1980 to 2020.The results of GMM model confirm that education has statistically significant and positive impact on economic growth and poverty has a significant but negative impact on the economic growth. More and more effort needed to reduce poverty and the improved techniques must be implemented to boost the country economic progress.

**Keywords:** *Education; Poverty; Economic Growth; GMM; Physical Capital.*

## 1. INTRODUCTION

In January 2016, the United Nation officially launched the 2030 Agenda for Sustainable this plan is based upon 17 goals (SDGs). These goals includes all the challenges which world is facing for many years. These goals will provide road map to the countries for make development in today's world. The famous MDG also play their role in ensuring Sustainable economic and social progress throughout the world. However due to their independents, complexity and systemic frameworks, the SDG pose lot of challenges to the developed countries which have less resources to complete these targets by 2030.

In a long list of diverse global difficulties such as poverty, education, illiteracy, climate change, terrorism, peace, pollution, environment, social security, tolerance, health, and basic requirements, Pakistan is one of the worst impacted countries. Many of these challenges are linked to education, economic development, and growth, either directly or indirectly. During a prior study of Pakistan's educational strategies, it was discovered that the majority of them concentrated on two key aspects: economic development and nation-building. Nonetheless, the country's failure to meet any of these goals is a problem. Education is the country's most pressing requirement in the modern period. It is regarded as the only means of ensuring the nation's and countries long-term growth. Education converts various societies, which is a commonly accepted truth in industrialized countries. Because they invest all types of resources into the nation for the development of human

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capital, many developed countries' living standards are high in HDI. Investing in the generations is a productive business in the contemporary world and ensures safe, healthy and productive individuals as well as collaborative IF we want development in any nation we have to emphasize on the education more and more. Raja (2005) examined that most important step toward progress is education. Education is bilateral process on one hand it enhance the economic growth and on other hand it reduce poverty and increase the productivity. It is very important step in developing countries like Pakistan, as they have less economic growth and high poverty spread.it also help us to increase human capabilities and to enhance the economic growth by providing skills and knowledge.

Education and poverty has strong linkage as parents in developing countries seem in difficulty to send their children to school due to wide spread of poverty. There isn't always a direct correlation between education and economic prosperity. There are lot of economic and non-economic variable which directly or indirectly effect the education and economic prosperity in Pakistan. When we look at the relationship between education, poverty, and economic growth in Pakistan, we also include a component called physical capital to aid our study. Physical capital is included in the study because it is considered to be the important ingredient of economic prosperity. Education and poverty also affected by the physical capital. It serves as important variable when we study the economic growth of any country. On one hand education is always overlooked by policy makers while on the other hand poverty in Pakistan is spreading at alarming rate due to government lack of attention. The study explores if there is one way or two way link between poverty, education and economic progress.

### 1.1. Objective of research:

The following goals guide the current research:

1. To examine the impact of education on poverty and economic growth in case of Pakistan’s economy.
2. In case of Pakistan economy, determine the causal relationship between education, poverty, and economic progress.
3. Suggest effective policy implications in the light of results of education.

## 2. LITERATURE REVIEW:

The first step in the way of progress is education it enable us to build a foundation for improving the country's social situation. Several studies have conducted which show the linkages between education, poverty and economic growth of the country at international and national level. Below is the literature review of some similar studies.

In general, education is seen as a critical tool for reducing poverty and to make economic progress. According tos Fabre & Augersaud-Veron (2004) in which study examined the effect of education and poverty on children that due to poverty parents are unable to send their child to school for education and in log run it effect the economic growth of the country.

They also show that due to lower quality of education the gap between poverty is widened and child labor is adding day by day so cope with this the government policies must improve to close the poverty gap by enhancing the quality education which contributes to economic growth.

Abdul-Hakim, Abdul-Razak, & Ismail, (2010) looks into the link between social capital and poverty. Study examined that with the increase in social capital the poverty reduces and it leads to the economic growth. Norton (2010) use OLS model to analyses the property right and economic freedom on schooling the result examined that economic right and social freedom increase the magnitude of schooling so it revealed that institution play their vital role to decrease poverty and help to strengthen the economic progress.

Without education, a country cannot develop properly. According to Raja (2005), education plays a crucial role in any country's development process. Education is bilateral process on one hand it enhance the economic progress and on other hand it reduce poverty and increase the economic efficiency. Education is crucial in the development of country such as Pakistan, as they have less economic growth and high poverty spread.it also help us to increase human capabilities and to enhance the economic growth by providing skills and knowledge.

In Pakistan, 45% of population is employed in agriculture sector, small farmers account for 85 percent of the total. Sabir, Hussain, and Saboor (2006) collected data from 300 small farmers in central Punjab to investigate their poverty levels. They discovered that education is one of the most important elements in reducing poverty. Pakistan education policy and facilities can help to reduce poverty and to enhance the economic growth.

Awan et al., (2008) used the Household Integrated Survey in 1998-99 and 2001-2002 to investigate the drivers of poverty in Pakistan. They employed different levels of education to research this as determinants of poverty so the results of their study show that education achievements and experience were inversely related to poverty. Chaudhry et al., (2010) also examined and explore the importance of education in alleviating poverty in Pakistan. According to the findings, primary and middle schooling are both positively and insignificantly connected to poverty. The study also explores that poverty and economic growth are inversely related Chaudhary et al, (2009) examined the causation link between higher education and economic growth in Pakistan using time series data. Using time series data from 1971-1972 to 2008-2009, Afzal, Rehman, Farooq, and Sarwar (2011) investigate the correlation and causality between education and economic advancement in Pakistan. They measured schooling using ten different factors in their study. The research investigates the long-term link between education, labor force, physical capital, and economic growth. In the light of their study they recommends more and more investment in education will leads to more economic progress in Pakistan.

The education has impact on poverty and economic growth of country. Now we will see from data that how these scholars finding will help us to act and determine the impact of education on poverty and economic progress in Pakistan case.

## 3. DATA SOURCE AND METHODOLOGY

The study use time series data beginning from 1980 to 2020 to conduct empirical result. Data of variable is taken from world development indicators (WDI). Data on secondary education enrollment from WDI. Real gross domestic product is used as a proxy to measure economic growth we then convert the RGDP in to economic growth using formula. Gross fixed capital is used as second proxy for physical capital. Poverty is measure using Head Count Index it is also used in many studies.

### 3.1. MODEL:

The most functional forms of important variable were specified as:

$$GDP = \mu 0 + \mu 1Edu + \mu 2PC + \mu 3Pov + \varepsilon_1 \quad (1)$$

$$Pov = \alpha 0 + \alpha 1RDGP + \alpha 2PC + \alpha 3Edu + \varepsilon_2 \quad (2)$$

$$Edu = \beta 0 + \beta 1RDGP + \beta 2PC + \beta 3Pov + \varepsilon_3 \quad (3)$$

Where

RGDP = it is a proxy used to measure economic growth know as real gross domestic product. RGDP as a proxy for economic growth has utilized before by Katircioglu (2009) Chadhary, Iqbal and Gillani (2009) also used RGDP as a proxy in their work. GDP at purchaser's prices is the sum of gross value contributed by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. We collect information from the WDI.

PC = physical capital. This is a proxy is used by many economist to conduct their analysis. This proxy is already used by Chaudhary et al, (2009). Afzal, Rehman, Farooq and Sarwar (2011). Outlays on additions to the economy's fixed assets, as well as net changes in the level of inventories, make up gross capital formation (previously gross domestic investment).

POV = It's an important variable in determining the economic growth.it is measure by head count Index. This measure is used by the Amjad and Kemal (1997) to analysis their work. The percentage of the population living below the national poverty line is known as the national poverty headcount ratio (s). National estimates are based on subgroup estimates from household surveys that have been population-weighted.

Edu = There are different indicators which are used to measure effect of education. However all of these measures do not capture the whole impact of education. We use comprehensive measure of schooling in this study. Secondary Education Index of Pakistan. Gross enrollment ratio is the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the education level shown.

### 3.2. ESTIMATION TECHNIQUE AND METHOD

The econometrics model of this is based on an overidentified equation with endogenous variables that are related to error term. Under these problems, OLS estimation produces

inaccurate and inconsistent estimations. In this we also cannot use three stages least square (3SLS) is also not unique estimation tool to deal with the problem of endogeneity. Furthermore, this problem is also addressed by the Generalized Least Square (GLS) estimate technique, which has a few additional assumptions.

We use Generalized Method of Moments (GMM) which is the expanded variation of instrumental variable technique that produce consistence results even when auto-correlation and heteroskedasticity are present which is big problem in data estimation. Second advantage of GMM is that it improves yield parameters by increasing the objective function which includes the moment limitations in which correlation between lagged repressor and error term is zero. These two features distinguish GMM from the 3SLS and GLS techniques. GMM is clearly consistent and efficient as compare to other techniques.so we have used this technique to estimate the equation of educations, poverty and economic growth separately.

The economic software E-Views12 has been used for estimation purpose. E-Views12 automatically calculates the probability value of J-statistic and other statics which are used to ensure that the model and the instruments utilized in these analyses are both valid. After the regression, we employ a normality test to ensure that the residuals have a normal distribution.

## 3.3. Diagnostic Tests

Before estimating the main technique we run some diagnostic tests to conduct some regression analysis before estimation and some are conducted after running regression.

All these test are describe below in detail in order to justify all estimation.

### 3.3.1. Descriptive Analysis

Descriptive statics are run at the first step of analysis. In descriptive statics we conduct the measure of central tendency, mean, median and mode these are use to describe the data set. Descriptive statics is the form of quantitatively characterizing the major features of a set of information. It summarizes a sample instead of using data to study about the population sample.

### 3.3.2. Unit Root Test (Augmented Dickey Fuller Test)

Next Step is to check the stationary of the variables it is necessary because if a series are non-stationary, all regression are invalid. This approach is used to determine the stationary of time series data is checking the existing unit roots in the time series. The most widely used test to check the unit root is the Augmented Dickey Fuller (ADP) it is proposed by the Dickey Fuller (1981). we need to check this because estimated F-statics loss accuracy in the presence of I(2) or higher orders.

### 3.3.3. GMM Test

This Test is applied to check the accuracy of instruments used during regression analysis. The reliability of the instruments used in estimation determines the accuracy of GMM estimator. J- Statics is used to check the accuracy of the instruments in which we check

overidentified condition is acceptable or not. E-Views automatically probability value of the J static which help us to see the validity of over identified restriction applied during GMM technique. J-statics probability value must be grater then 0.5 if the restriction of over identified is apply.

## 4. EMPIRICIAL RESULTS

### 4.1. DESCRIPTIVE ANALYSES

Descriptive statics is the first step of statically analysis. We first conduct this analysis

**Table 1.** Descriptive statics result

| Variables | Observations | Mean | Median | max | Min | Std. Dev. |
|---|---|---|---|---|---|---|
| growth rate (GDP) | 41 | -5.58134 | -4.94958 | 13.06367 | -23.2192 | 7.195955 |
| Secondary Education (H) | 41 | 21.40351 | 21.66999 | 44.86815 | 0.042037 | 14.37613 |
| Poverty (HC) | 41 | 9.103668 | 0.558212 | 64.3 | 0.00087 | 17.68865 |
| Fixed Capital Formation (k) | 41 | 3.662644 | 4.32771 | 15.77323 | -12.7923 | 6.504645 |

We use time series annually data which conation 41 observation of every variable used in this analysis. The descriptive analysis shows that growth rate has mean value of -5.58134 with min value-23.2192 and maximum value of 13.06367. The value of the standard error is 7.195955 which is small it show that the data is cluster around our mean averages values. Economically, the reason is that the growth rate of GDP has been consistent over the years in Pakistan. There are lots of other factors which are responsible for this which includes economic, social and political factors.

The value of the secondary education ranges from 0.042037 to 44.86815 with the average value of 21%. Furthermore the value of standard deviation shows that the mean value points differ by 14%. So this show that with the passage of time in Pakistan education enrollment in secondary is increasing because government also pay attention towards education people with the passage of time will get awareness about education importance.

Similarly, Poverty mean value is 9.103668 percent. Standard deviation has small poverty value which indicates that Pakistan is highly poverty country and no such progress is made to reduce this on government level.

Descriptive statics for fixed capital formation show that minimum value is -12.7923 and maximum value is 15.77323 which demonstrate the increased level of variation in data.

### 4.2. RESULTS OF UNIT ROOT TEST (AUGMENTED DICKEY FULLER TEST)

**Table 2.** Augmented Dickey-Fuller test (Unit Root Test)

| Level | | | First Difference | |
|---|---|---|---|---|
| variable | Intercept | intercept and trend | Intercept | intercept and trend |
| GDP | 0 | 0.002 | 0 | 0 |
| H | 0.8193 | 0.7996 | 0 | 0 |
| HC | 0 | 0 | 0 | 0 |
| K | 0.0018 | 0.0075 | 0 | 0 |

Above table reports the results which we conduct for unit root analysis with intercept at level and first difference and also we also proceed with trend and intercept at level and first difference. The variable of GDP and poverty (HC) is stationary at level form, while reaming two variables Secondary Education (H) and fixed capital formation (K) are stationary at first difference which clearly implies that these variables are difference stationary with one order of Integration I (1).

Now after conducting descriptive and unit root analysis, now our next step is to move on the main estimation analysis of the study through technique of Generalized Method of Moments (GMM)

## 4.3. Generalized Method of Moments (GMM)

**Table 3.** Dependent variable GDP

| Variables | Secondary Education (SE) | Poverty (Head Count Ratio) | Capital Formation (K) |
|---|---|---|---|
| *Coefficient* | | | |
| t- statistics | -11.02409 | -7.696014 | 3.292504 |
| Prob. | 0.0000 | 0.0000 | 0.0013 |
| | | Diagnostic Tests | |
| J-Statistics | | | D.W.Stat |
| 0.437531 | | | 1.302145 |

*Dependent variable Gross Domestic Products*

**Table 4.** GMM Dependent Variable (Secendary Education)

| Variables | Economic Growth (GDP) | Poverty (Head Count Ratio) | Capital Formation (K) |
|---|---|---|---|
| *Coefficient* | | | |
| t- statistics | 2.773492 | -7.696014 | 3.292504 |
| Prob. | 0.0065 | 0.0000 | 0.0013 |
| | | Diagnostic Tests | |
| J-Statistics | | | D.W.Stat |
| 0.437531 | | | 0.96570 |

*Dependent variable Secondary Education (SE)*

**Table 5.** GMM Dependent Variable (Poverty)

| Variables | Economic Growth (GDP) | Secondary Education (SE) | Capital Formation (K) |
|---|---|---|---|
| *Coefficient* | | | |
| t- statistics | 2.773492 | -11.02409 | 3.292504 |
| Prob. | 0.0065 | 0.0000 | 0.0013 |
| | | Diagnostic Tests | |
| J-Statistics | | | D.W.Stat |
| 0.437531 | | | 1.302145 |

*Dependent Variable Poverty (HC)*

In this estimation we take economic growth as dependent variable and education, poverty and capital formation as independent variable in first estimation model we check the relationship between economic growth, Education, poverty and capital formation using GMM technique. So important Growth determinants are includes in the regression analysis. The result which we get from the estimation clearly shows the true picture of the economic condition of Pakistan. Education variable is statistically significant impact of

economic growth. So higher is the education rate in Pakistan the more people will contribute in the economic progress. In case of Pakistan the education result was not positive there is no institutional work is done to promote more education. Child labor is common so more work must be done to make it positive.

Poverty has a negative relationship with economic growth because in Pakistan GDP level is low which will result in drop of per capita income and the poverty will increase so the economic growth will hinder. The result is not significant in the case of Pakistan there is some work done to reduce it, but some more work is needed to increase our per capita GDP.

When we talk about capital formation it has positive and significant association with economic growth. It has shown that in the past, there is low capital in Pakistan due to which in industrial and agriculture sector progress is not up to the mark, but with the passage of time and with the technological advancement capital increase and it also increase the economic growth but more work is needed to be done in this sector.

## 5. CONCLUSION & RECOMMENDATIONS

Investing in education is the critical to the process of economic prosperity. Education is the key to reducing poverty and enhancing both individuals as well as society socio-economic position. The present research shows the casuals relationship between education, poverty and economic growth including of physical capital in economic growth. Poverty is important in deterring these two. We use ADF test to see relationship between them. The results of GMM also show that there is relationship between them all. When we use education, poverty and economic growth as dependent variable we exam that there is a long run relationship between them all. We see in this study that physical capital and economic growth (GDP) has been found to be significant and positive. Education effect economic growth (GDP) positively but it is significant in case of Pakistan. If we want to make it positive better education should be provided to reduce poverty and to enhance economic growth in Pakistan. Poverty and Economic Growth (GDP) are inversely related with each other because economic growth is low so that poverty is high if we want to reduce poverty per capita income should be increase. Income should be distributed equally among all citizens to reduce poverty and to enhance the economic growth.

Education is the most important tool which effects the economic growth rather than poverty. Physical capital is the most important variable which explains the Education, poverty and economic growth linkages. Few policy implications emerge from the empirical analysis.

1. Government and other policy maker should work hard to reduce Poverty and increase Education.
2. Such institutions should be developed by the government, which specially works to reduce the poverty.
3. The study also recommends education must be the most important agenda of the government for economic progress.

4. Growth in the country must be increased with the education enhancement and poverty reduction.

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