

# LEARNING AND EARNING:EXPLORING THE ECONOMIC BENEFITS OF DIFFERENT LEVELS OF EDUCATION IN PAKISTAN

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## ABSTRACT

This paper inspects the role of educational achievement, both on an aggregate and disaggregated level on economic growth in Pakistan. Diversity in literacy rates will produce different outcomes. As many individuals with higher education get higher returns from their education level. Investment in education produces skilled and efficient manpower making it approachable for any country to achieve economic objectives i.e. sustainable economic growth and development. Data for the empirical analysis has been taken from 1976-2020 on annual basis. Auto-Regressive Distributed Lag (ARDL) Approach to Cointegration was applied for the analysis and it was concluded that middle and higher education levels produce a higher return to the economy as a whole. So, the investment must be made to enhance the overall economic gains.

**Keywords:** Education, Investment, returns, ardl

## INTRODUCTION

In recent years there has been considerable interest in establishing the correlations between educational attainment and earnings reflect the causal impact of schooling on earnings. Education contributes a lot to the formation of human capital. Investment in education produces skilled and efficient manpower making it approachable for any country to achieve economic objectives i.e. sustainable economic growth and development. Education is a currency for the development of human capital treating it inseparable from human capital development. Endogenous Growth models (Lucas, 1988) and augmented growth models emphasized the role of education to determine economic growth.

Economics of education as a separate field has been launched in the early 1960s which shows significant development in previous decades. It differentiates Human capital from physical capital as a factor of production. Investment in human capital in form of education can produce economic effects. Cost of investing human capital, returns on investment or return to education, and increased productivity are three major economic effects derived from investment in human capital (Weil& Wilde, 2009). Physical capital cannot by itself drive economic development but education and skill act as a game-changer to achieve economic objectives along with physical capital. The theory of human capital plays a significant part in modern labor economics wherein it shows a significant relationship between education and earning. Said theory suggests earnings rise rapidly as the levels of education get better. Numerous studies enlightened this fact that more educated people earn a higher wage, observe less unemployment and engage in more prestigious professions than their other less educated fellows (Cooper & Cohn, 1997; Fabra&Camisón, 2009).

Some prominent contributions in education economics are by Shultz(1961), Becker (1964), and Mincer(1974) who emphasize education as the investment in human capital. Knowledge and skill through education is a form of capital. Education is an investment in human capital rather than cost, the difference in earnings rise with the difference in access to education. Skills and knowledge stimulate the ability of individuals to enhance their productivity leading to a positive rate of return (Schultz, 1961). Earning is a linear function of varying levels of education and on-job training (Mincer, 1974). Numerous studies enlightened the role of education as a screening device by providing knowledge and skills and by guiding the individual to opt for the right professions. Education is one of the important bases for screening which indicates to the employer about the basic skills, abilities, and knowledge of individuals. The personal abilities of individuals are important for the firms as ability raises the productivity of any firm (Stiglitz, 1975).

Education is crucial for the development of any country and Pakistan like other developing country is experiencing crises in the education sector. Numerous studies have enlightened this fact that higher earnings are linked with higher levels of education in Pakistan (Farid *et al.* 2010); Chaudhary *et al.* 2010) estimated the return to education in Pakistan wherein the private rate of return to education (Afzal, 2011), determinants of the rate of return (Khan & Irfan 1985), the impact of occupation, schooling and experience on earning, comparison between the earnings of male and female employees/workers (Khalid & Choudhry, 2021) the relationship between education, skills and labor market outcomes, the relation between education, employment and earning, the causal relationship between education and earning have been estimated.

#### **LITERATURE REVIEW**

The literature on human capital was mostly based on the concept of the rate of return to the investment in human capital in the 1960s. Later on, the role of education is treated as a screening device that indicates the skills and abilities of any individual including the works of (Arrow, 1973) and (Stiglitz, 1975). Lucas (1988) and Romer (1986, 1990) highlighted the macroeconomic aspect through endogenous growth theory.

Becker (1962) endeavors that expenditure incurred on education by the state or household is the investment flows that form human capital. Accumulation of human capital stimulates higher earnings in labor markets as a result of investment in human capital. A linear relationship exists between log earning and level of schooling, experience, and its square as defined in the Mincerian wage equation. Where in coefficient of education is referred to as the rate of returns to education.

Afzal *et al.*, (2011) studied the return to education and education inequality in Pakistan wherein the private rate of return to education, determinants of the rate of return, impact of occupation, schooling and experience on earning, comparison between the earnings of male and female employees/workers, the relationship between education, skills, and labor market outcomes and the relation between education, employment and earning have been estimated. Ferrer and Riddell (2002) found that the returns for a bachelor's degree were approximately 25% for both genders compared with a high school diploma in Canada. The analogous returning to a professional degree exceeded 35%. This study revealed that the importance of credentials increases with educational attainment, accounting for 30% of the return to 16 years of schooling but more than half of returns above 16 years.

Thrane (2010) was the first to study the Norwegian tourism industry. The study found that the earnings of returns to educational degrees are the net of returns to the accumulated years of schooling. The results statistically and economically showed significant sheepskin effects, with the returns to educational degrees exceed the returns to years of schooling for both male and female employees. Siphambe (2008) examined rates of return to education in Botswana. The data used from the time 1993-1994 for analysis. The result showed still well-suited then rates of return mostly rising then the level of education.

#### **DATA AND METHODOLOGY**

##### **Data sources**

The present research has used time-series data on education, real gross domestic product, poverty, and physical

capital for the time of 1971-72 to 2017- 18 in the case of Pakistan. Data were collected from various issues of the Pakistan Economic Survey, publications of the Federal Bureau of Statistics and Annual Reports, State Bank of Pakistan. Various functional forms have been tested to check the relationship between education, poverty, physical capital, and economic growth in Pakistan. The most appropriate functional forms of the interested variables were specified.

## METHODOLOGICAL FRAMEWORK AND MODEL SPECIFICATION

Various measures were implemented at different times understudy of human capital in Pakistan. However, in this study, we concentrate only on the education level on percapitaearnings. We test the hypothesis by employing an autoregressive distributed lag (ARDL) modeling approach. The present study consists of two models which are as follows.

### Model 1: To Establish the Impact of Various education levels on per capita earnings

The first model of our study is associated with the effect of education and per capita earnings, Labour force participation rate, literacy rate, agriculture growth, and education enrolment index have been taken for the first model.

$$INCPC = f(EDUI, EDUII, EDUIII, GFCF, PHCR, AGRIGR, POPG, LFPR) \quad (1)$$

$$INCPC = \beta_0 + \beta_1 (EDUI) + \beta_2 (EDUII) + \beta_3 (EDUIII) + \beta_4 (GFCF) + \beta_5 (PHCR) + \beta_6 (AGRIGR) + \beta_7 (POPG) + \beta_8 (LFPR) + \varepsilon \quad (2)$$

### Model 2: To Establish the Impact of education index on per capita earnings

The second model of our study is related to the effect of the aggregate education index on the earning per capita

$$INCPC = f(GFCF, PHCR, AGRIGR, POPG, LFPR, EDUINDEX) \quad (3)$$

$$INCPC = \beta_0 + \beta_1 (GFCF) + \beta_2 (PHCR) + \beta_3 (AGRIGR) + \beta_4 (POPG) + \beta_5 (LFPR) + \beta_6 (EDUINDEX) + v \quad (4)$$

Where,

INCPC=Per capita income

EDUI= Primary enrolment rate

EDUII= Secondary enrolment rate

EDUIII= Higher enrolment rate

GFCF= Gross fixed capital formation

PHCR= Poverty headcount ratio

AGRIGR= Agriculture growth rate

POPG= Population growth rate

LFPR= Labour force participation rate

EDUINDEX= Education index

$\varepsilon$  = Error Term

$v$  = Error Term

## RESULTS AND DISCUSSION

### Descriptive Analysis of the Data

This analysis gives basic summaries of the data. It is used for the quantitative analysis of the data. The descriptive statistics of our model are as follows. We have used combined the models for analysis and the elementary analysis.

**Table1: descriptive analysis of the data**

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
INCPC	2.2595	2.1893	6.6856	-1.4495	1.8337	0.1855	2.6403
EDUI	67.3109	55.8221	94.8091	47.8866	17.1256	0.5032	1.5412
EDUII	27.3005	27.2057	46.1092	16.5065	8.5016	0.6404	2.4537
EDUIII	0.5502	0.3832	1.061	0.2685	0.2804	0.6771	1.6792
GFCF	17.773	18.1424	20.8183	14.1206	1.6096	-0.5257	2.4286
PHCR	24.9655	23.4772	34.6	17.32	3.9962	0.7841	3.1045
AGRIGR	3.5842	3.6	11.7	-5.3	3.6477	-0.2652	3.5879
POPG	2.5756	2.4846	3.3604	1.9541	0.5047	0.3095	1.4794
LFPR	82.3526	82.755	87.2	52.1	5.5097	-3.9883	22.8522
EDUIINDEX	92.2569	82.9496	199.465	6.1978	67.1334	0.2654	1.6187

Source: Estimation by the Author Using E-Views 9

### Correlation Analysis

Correlation analysis is a technique of the statistics valuation applied to learn the strength of affiliation among two, constant variables. It can be either positive or negative. The existence of positive correlations only when there is a change (increase) in the variable simultaneous with the change (increase) in another variable.

**Table 2: correlation analysis of the data**

	INCPC	EDUI	EDUII	EDUIII	GFCF	PHCR	AGRIGR	POPG	LFPR	EDUIINDEX
INCPC	1									
EDUI	-0.0709	1								
EDUII	-0.3244	0.7742	1							
EDUIII	0.2105	0.8362	0.4779	1						
GFCF	0.0742	-0.1796	-0.0001	-0.0329	1					
PHCR	-0.1898	-0.1173	-0.2012	-0.2627	-0.4577	1				
AGRIGR	-0.0222	-0.1496	-0.1483	0.0199	-0.0614	-0.1869	1			
POPG	0.2409	-0.8473	-0.8733	-0.5673	0.2821	-0.0325	0.1035	1		
LFPR	0.1557	-0.2482	-0.294	-0.181	-0.0754	0.2909	0.0547	0.2338	1	
EDUIINDEX	-0.2109	0.9183	0.9248	0.6952	-0.199	-0.1437	-0.1096	-0.9429	-0.2881	1

Source: Estimation by the Author Using E-Views 9

### Unit root analysis

In statistics and econometrics, ADF (Augmented Dickey-Fuller) technique is used to check the existence of the unit root. It is an augmented version ADF technique.

**Table3: unit root analysis**

VARIABLES	At level	At difference	first
INCPC	0.2 176 (0.9702)	-1 .7770 (0.6961)	
EDUI	-6.6079 (.0000)		
EDUII	-1.4718 (0.5365)	-3.2218 (0.0959)	
EDUIII	0.4867 (0.9838)	-3.6859 (0.0357)	
GFCF	-2.5521 (0.1117)	-1.5558 (0.7916)	
PHCR	-2.4717 (0.1306)	-8.9195 (0.0000)	
AGRIGR	-5.4794 (0.0001)		
POPG		-4.2974 (0.0018)	
LFPR		-5.7980 (0.0000)	
EDUINDEX	-3.8831 (0.0051)		

Source: Estimation by the Author Using E-Views 9

Unit root analysis is presented in table 3 is drawn from the Augmented Dickey-Fuller test. The Augmented Dickey-Fuller test shows that INCPC is integrated of order 1, I(1) and the series is nonstationary. EDUI and EDUII are integrated of order 0, I(0) and the series is stationary. EDUIII is integrated of order 1, I(1) and the series is non-stationary. GFCF and PHCR are integrated of order 1, I(1) and the series are non-stationary. AGRIGR is integrated of order 0, I(0) and the series is stationary. POPG and LFPR are integrated of orders 1, I(1) and the series is non-stationary. EDUINDEX is integrated of order 0, I(0) and the series is stationary.

#### Co-Integration Analysis Using Bound Test

The first step of the ARDL forming for model 1 is based on the relationship between GDP and FDILS and other independent variables. We investigate the existence of a long-run relationship among the variables.

**Table 4: Cointegration Results**

Model 1			Model 2		
F-statistic	7.066571		F-statistic	4.957857	
<b>Significance</b>	<b>I0 Bound</b>	<b>I1 Bound</b>	<b>Significance</b>	<b>I0 Bound</b>	<b>I1 Bound</b>
<b>10%</b>	1.95	3.06	<b>10%</b>	2.12	3.23
<b>5%</b>	2.22	3.39	<b>5%</b>	2.45	3.61
<b>2.50%</b>	2.48	3.7	<b>2.50%</b>	2.75	3.99
<b>1%</b>	2.79	4.1	<b>1%</b>	3.15	4.43

Source: Estimation by the Author Using E-Views 9.

The calculated value of F-statistic for model 1 is F=7.066571 that is above the lower and upper bound of the critical value so we reject the null hypothesis of no long-run relationship among the variables.

**Table 5: Auto-Regressive Distributed Lag (ARDL) short-run analysis**

Variable	Model 1			Variable	Model 2		
	Coefficient t	t-Statistic	Prob.		Coefficient t	t-Statistic	Prob.
D(INCPC(-1))	0.449535	2.5742	0.0244	D(INCPC(-1))	0.909953	1.888724	0.0833
D(EDUI)	3.677771	0.926116	0.3726	D(GFCF)	0.850155	1.488939	0.1572
D(EDUII)	0.596314	2.264969	0.0428	D(GFCF(-1))	0.085507	2.107627	0.0568
D(EDUIII)	0.212599	2.072409	0.0604	D(PHCR)	-0.566687	-2.014745	0.0669
D(GFCF)	0.771074	2.124315	0.0551	D(AGRIGR)	0.008139	0.085834	0.9327
D(GFCF(-1))	0.909953	1.888724	0.0833	D(AGRIGR(-1))	0.161011	1.585665	0.1337
D(PHCR)	0.250942	1.308063	0.2154	D(POPG)	23.13394	2.72345	0.0157
D(PHCR(-1))	-0.4513	-2.16085	0.0516	D(LFPR)	0.008887	0.168489	0.8684
D(AGRIGR)	0.101669	1.259038	0.232	D(EDUIINDEX)	0.043515	0.626105	0.5407
D(POPG)	-0.67546	-7.05355	0.736	D(EDUIINDEX(-1))	0.175167	2.586974	0.0206
D(LFPR)	-0.04085	-0.7806	0.4502	CointEq(-1)	-0.58918	-6.11635	0.0000
D(LFPR(-1))	-0.08551	-2.10763	0.0568				
CointEq(-1)	-1.02965	-4.67296	0.0000				

Source: Estimation by the Author Using E-Views 9

**Table 6: Long-run analysis for model 1**

Variable	Coefficient	t-Statistic	Prob.	Variable	Coefficient	t-Statistic	Prob.
<b>EDUI</b>	0.008757	0.149813	0.8834	<b>GFCF</b>	-0.63511	-2.13562	0.0496
<b>EDUII</b>	0.117264	3.384926	0.0002	<b>PHCR</b>	-0.16643	-2.14608	0.0486
<b>EDUIII</b>	1.912022	2.141734	0.0497	<b>EDUIINDEX</b>	1.50245	3.301127	0.0048
<b>GFCF</b>	0.596314	2.264969	0.0428	<b>POPG</b>	0.53989	0.358563	0.7249
<b>PHCR</b>	-0.83432	-3.80987	0.0025	<b>LFPR</b>	0.005261	0.166159	0.8703
<b>AGRIGR</b>	0.154028	2.121545	0.0554	<b>AGRIGR</b>	0.210954	2.537964	0.026
<b>POPG</b>	0.332798	0.349056	0.7331				
<b>LFPR</b>	0.771074	2.124315	0.0551				
<b>C</b>	-7.77722	-1.33216	0.2076	<b>C</b>	16.9259	1.696776	0.1104

Source: Estimation by the Author Using E-Views

**Table 6:** describes the long-run analysis of the data. Education at a higher level has the coefficient EDUI, 0.008757, EDUII, 0.117264 and EDUIII, 1.912022 is education enrollment at primary, secondary, and at a higher level. Coefficients are significant for secondary and the higher level but the primary education is found to be insignificant that follows the Mincer conclusion as a higher level of education increase earnings. The primary level of education is not found significant that enhance earnings. It suggests that the increase in education at the primary level does not contribute to income. Gross capital formation GFCF has a coefficient of 0.596314 that is positively and significantly related to earnings. Headcount ratio PHCR has a value of -0.83432 that shows an inverse association with earnings as denoted by the results in the short run. The headcount ratio is not found significant that enhance earnings. It suggests that the decline in poverty is associated with enhancing income. Agriculture growth rate AGRIGR has the value of 0.154028 and the labor force has the value LFPR, 0.771074 that has a positive impact on earnings. The end value of the population growth rate is POPG, 0.332798 that is insignificant in the long run but showed a significant impact in the short run. Gross capital formation GFCF has the coefficient GFCF -0.63511 that is positively and significantly related to earnings. Headcount ratio PHCR has value PHCR -0.16643 that shows an inverse association with earnings as denoted by the results in the short run. The headcount ratio is not found significant that enhance earnings. It suggests that the decline in poverty is associated with enhancing income. Agriculture growth rate has the value AGRIGR, 0.210954 and the labor force has the value LFPR, 0.005261 that has

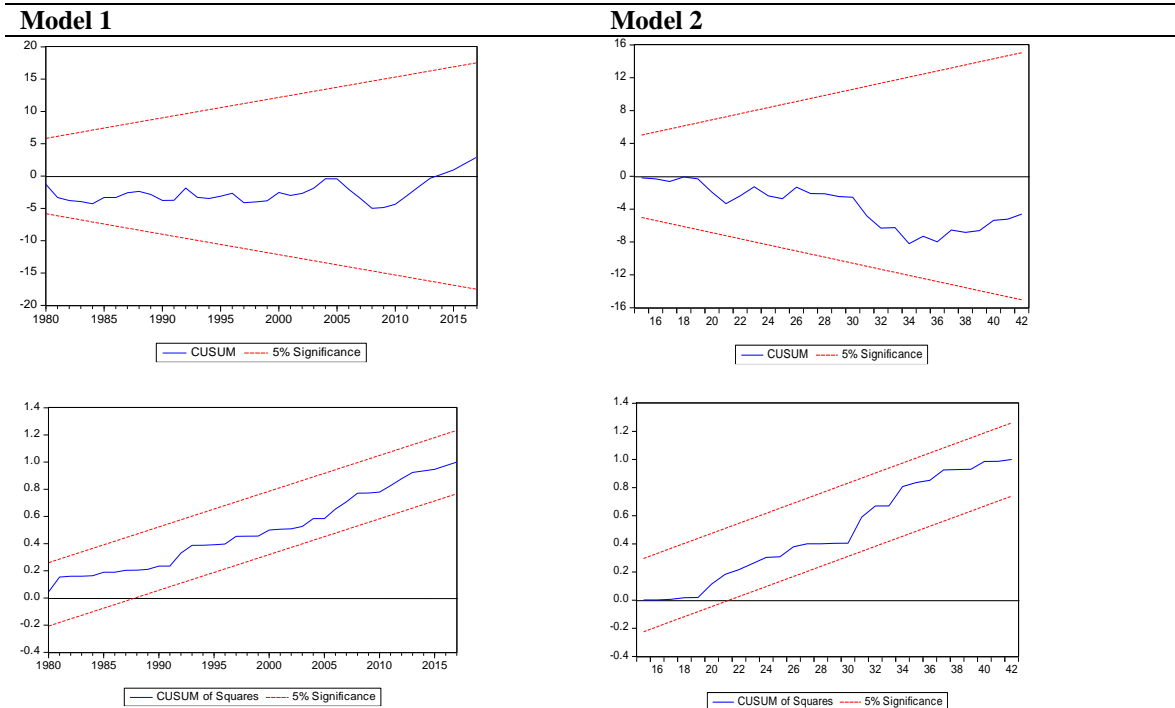
a positive insignificant impact on earnings. The end value of the population growth rate is POPG 0.53989 that is insignificant in the long run but showed a significant impact in the short run.

**Diagnostic analysis**

<b>Model 1</b>	<b>Breusch-Godfrey LM Test</b>		
	<b>F-statistic</b>	<b>Prob.</b>	<b>Result</b>
	0.3828	0.79	There is no autocorrelation in this model.
	<b>White Heteroskedasticity Test</b>		
<b>F-statistic</b>	<b>Prob.</b>	<b>Result</b>	
0.7865	0.61	There is no heteroskedasticity in this model.	
<b>Model 2</b>	<b>Breusch-Godfrey LM Test</b>		
	<b>F-statistic</b>	<b>Prob.</b>	<b>Result</b>
	0.8286	0.96	There is no autocorrelation in this model.
	<b>Heteroskedasticity Test: White</b>		
<b>F-statistic</b>	<b>Prob.</b>	<b>Result</b>	
0.7865	0.61	There is no heteroskedasticity in this model.	

Source: Estimation by the Author Using E-Views 9

**Stability Analysis**



Source: Estimation by the Author Using E-Views

## CONCLUSION AND POLICY RECOMMENDATION

Education expansion is indispensable to increase the productivity of a worker to make them compatible with the current demand of efficient and skilled labor force. One of the major deductions of this study is that a higher level of education leads to higher earnings. In this way, it is vital to concentrate on the education sector. Easy and cheap access to education should be provided for every individual and the provision of higher quality education should be one of the major objectives. In this study, two moderating variables are employed to examine their effect on the relationship between education and earning. Government should invest to improve the condition of these deprived areas and should play its part to remove the barriers in education attainment. It can be argued that such types of policies may be formed which encourage students to get higher education, as a result highly educated students will be able to get higher returns from their education level. As we have observed that higher education has a positive contribution to students' monthly earnings during their studies. So, Government may start such programs which give part-time jobs or scholarships and stipend to students because it encourages students and they will give more attention to their studies.

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