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The Return on Investment for Education in Pakistan

Raima Nazar
School of Economics, Bahauddin Zakariya University, Multan, Pakistan
Email: raimanazar@yahoo.com

Imran Sharif Chaudhry
School of Economics, Bahauddin Zakariya University, Multan, Pakistan
Email: imran@bzu.edu.pk

Abstract

The study provides estimates of the private returns to education in Pakistan by using a random sample of 850 wage earners including male and female from different professions between age group 15-65 years from Multan district. This study provided a novel contribution by providing an in-depth analysis of return on investment for education by focusing on both aspects of education like quantity and quality of education and in case of quantity, education is treated both as a continuous and discrete variable. By using ordinary least square technique and by following the procedure of Mincer earning function this study examined the earning disparities due to gender, location (rural–urban), marital status, medium of instruction and found that female wage earners have higher returns to education. Similarly, people living in urban areas enjoy high returns to investment in education. Due to greater job mobility unmarried workers get higher returns while in case of levels of education returns increases gradually. In case of qualitative returns we found that English medium of instruction plays a highly significant and positive role in earnings.

Keywords: return on human capital, return on investment, university education, secondary education, primary education.

1. Introduction

According to the classical view about the development debate of 1960s, labor, land and capital were recognized as the main indicators of production in which the main focus was on the capital by increasing the investment on capital by 15 percent of the GDP to attain a growth rate of at least 5 percent. During 1970s, the definition of capital was expanded and human capital was also included in it. Investment in education with improved technology leads to faster economic growth and higher productivity. The economic rationale for the investment in education was well established during 1980s.

In 1990, the launching of Human Development Report by UNDP was another landmark in the conceptual framework for development. This report suggested supplementary criteria for calculating the performance called the Human Development Index (HDI) pioneered by Dr. Mahboob ul Haq. This concept put people at the center of development

by emphasizing that human development was not the name of rapid economic growth but also an end in its own right, as it gives security to the people in their homes, in their jobs, in their communities and in their environment.

Despite of a reasonable increase in enrollment and educational institutions during 1980s and 1990s, labor market of Pakistan is still insufficient in skilled and educated man power. This may be due to the result of inconsistency between demand suitability and attained education for the graduates in the job market. It creates many economic and social problems i.e. earning profiles with low income and unemployment both at macro and micro levels.

Education is a powerful determinant of human capital that enhances ability and creativity and an educated person can become a more productive part of the economy. Pakistan is facing problems regarding education sector since independence in 1947 and current investment in this sector is not satisfactory and far below than international standards. Moreover, Pakistan is a signatory of Millennium Development Goals (2000-2015) and improvement of education was also an important goal where net primary enrollment ratio, literacy rate and survival rate from grade 1 to 5 were some main indicators of education. Therefore this study is planned to provide benefits of investment in education in Pakistan.

Although, a lot of work had been done on returns to education in various countries and in Pakistan also but those studies focused on returns to investment in quantity of education only and most of the times treated education only as a continuous variable especially with reference to Pakistan and very few studies focused on investment in quality of education and almost no evidence was found on disaggregated analysis on returns to investment on education in Pakistan in various dimensions.

This study collectively explored various dimensions of returns on investment in education in Pakistan. It provided returns to investment on quantity of education by treating education as continuous variable like total years of education and then as discrete variable by estimating returns to different levels of education from primary to university level to explore the demand for educated workers in job market of Pakistan and in order to provide sound basis for policy makers for district Multan of southern Punjab where education sector is not performing up to the mark and literacy rate is poor that is 45 percent only. Moreover, this study also provides returns to investment in quality of education by taking medium of instruction as a proxy variable. The findings of returns to investment in education are further disaggregated by gender, region and marital status and medium of instruction to provide a basis for investment priorities.

2. Literature Review

It is misconception that economics of education or economics of human capital is recently developed by Becker and Shultz in 1950s and 1960s. But actually from more than 300 years the theory of human capital existed in economic and statistical literature. In 1676, Sir William Petty had made the first attempt to estimate the nation's stock of human capital. After a century, in 1976, Adam Smith, a founder of Economics, had written a book "An Inquiry into the Nature and Causes of the Wealth of Nations" in which he defined the role of human capital.

The classical theories of human capital presented by Becker (1962) and Mincer (1974) considered that education and training are major sources of accumulation of human

capital and they have positive and direct effect on the life time earning of a person. The coefficient of years of school, in Mincer earning function indicated the returns to education i.e., with an additional year of schooling how much increase in earning takes place. According to Shultz (1961), education and training lead to knowledge, high productivity of labor and modern production techniques which further lead to technical development. It also increases productivity by providing with necessary skills and knowledge and by molding the behavior of labor.

Johnson and Stafford (1973) explored the importance of investment in quality of education along with quantity of education. For this purpose they collected data from survey research center of the University of Michigan in 1965. Along with conventional variables related to individual characteristics they collected data on the state in which the respondents grew up. For measuring the effect of quality of education they considered expenditure per pupil that was adjusted for prices in 1964. The inclusion of quality variable does not alter the effect of years of schooling on earning but quality of education itself had a significant effect on earnings of individuals. They found that 1.4 percent of variation in earnings was due to average per pupil expenditure.

Guisinger et al. (1984) by utilizing data from 1000 households estimated the rate of returns to incremental investment in education and its effect on the level of employment. They followed the Mincerian earning function and explored that earning power was acquired by schooling and experience. They concluded that rate of return to public investment in schooling was low and it increased with increase in the level of education.

Khan and Irfan (1985) calculated private returns of education at various levels through earning function. They found that the rate of returns changed positively with different level of education. It was found that in Pakistan the private returns to education were found to be lower than in other under-developed countries. They also found significant and positive association between family background of individual and his earnings.

Siphambe (2000) evaluated the private rate of returns to education in Botswana by employing a modified form of Mincer human capital model (1974). He explored that earnings were increased with the higher level of education. Female workers on the average earned less than male with the same level of education but this inequality fell gradually at higher level of education. Similarly Psacharopoulos and Patrinos (2004) reviewed the research of international level about the returns of investment in education sector and found that the rate of average return to additional year of education is 10 percent. The low and middle income countries have highest returns of education. They also found that the tendency of returns to education was higher for females than males in under-developed countries which show that females have lower base level of education than their male counterparts.

This study is consistent with the findings of Klazar et al. (2001) where returns of investment in education were estimated at international level and also disaggregated for gender and found almost consistent results with this study. Daoud (2005), Pastore and Verashchagina (2006), Kimenyi et al. (2006), Qiu and Hudson (2010) and Sohn (2013) also evaluated private returns to investment in education for different countries by using different methodologies and data set but found almost consistent results with this study.

Fulford (2014) evaluated returns to education in India by using data from Indian national sample surveys. He explored that individuals with more years of education lived in

households with more consumption per capita and approximately on additional year of education leads to 4 percent more consumption for men with no additional consumption for female cohort. Average returns to education were low for both men and women but most of the highly educated Indians got more returns because of India's growth. The low returns were due to low quality of education and poor mathematics and reading scores.

Frank and Hovey (2014) proposed a new approach of returns on investment in education that is system strategy approach they argued that in return to investment analysis expected gains per unit of cost is evaluated for elementary education but it does not focus on student learning. Therefore, system strategy approach is more appropriate for elementary learning analysis because it focus on student's needs and can help to make better use of limited resources.

Pribac et al. (2016) also estimated the impact of education on GDP per capita in Romania by using Mincer earning function (1995) and found a positive relationship between education and GDP per capita. Dziechciarz (2016) discussed the modern methods of measuring the returns of investment in education and training.

In the context of above situation, it is right time that the role of education for the betterment of individuals and society is explored and analyzed. As the education is considered as an investment, the instantaneous natural question is: what will be the outputs of this investment in education to compare it to its alternatives? This comparison can give different priorities for the allocation of public expenditures to various levels of education, or can define the behavior of a person about the demand or lack of demand for these public services.

Returns of education are the reward of investment in education sector. This reward may be in the form of income and other social returns like status, accommodating attitude, honor etc. Returns on education can be calculated in different ways: private or social, monetary and non-monetary. As Dziechciarz-Duda and Krol (2013) evaluated the non-monetary benefits of education like low fertility and crime rate, higher health status and a better environment. They found a significantly positive relation with investment in education and non-monetary returns. Although these results are less obvious as compared to private monetary returns to investment in education.

Private returns of education are disclosed by higher salaries or wages that accrue to the employee or worker. Higher educational returns encourage more students to enroll in those disciplines which have higher demand in the job market. This may include high political awareness, rich interaction about culture in society and more contribution in human knowledge. It also includes improvement in the welfare of individual that are not a part of measured earnings (e.g., better working environment, easy access to highly paid job and so on). An analysis of such returns can also help to formulate or evaluate education policies. Governments seek to adopt such economic policies which are consistent with the development of human capital.

3. Structure and Profile of Education Sector

Education sector in Pakistan includes primary level of education to professional level which is almost similar in all the provinces. The duration of primary level of education is five years; pre-secondary or middle level has three years and matriculation or secondary level includes two further years of schooling. Individuals have two options after completion of secondary level of education; either of continuing two further years of

formal education called higher secondary or intermediate level or enroll in some technical institute for a three years associate diploma program. The higher secondary school is the gateway to either enrolling in professional college or to continue two more years of general education leading to the degree of graduation. Those who complete their graduation can pursue for postgraduate or masters degree from a university. After completion of post-graduation, an individual can pursue for higher qualification i.e. M. Phil and PhD degree.

In mostly schools of Pakistan the English is taught as a second language. Local languages are also used in public schools as a medium of instructions in some provinces of Pakistan. On the other hand, private schools in Pakistan mostly used English as a medium of instructions and are considered more efficient in terms of textbooks, pedagogy and physical infrastructure. At higher education levels i.e. post-graduation and professional level, the system is more or less uniform and the curriculum is mostly in English.

A micro study was conducted regarding this issue based on Multan district. Multan is a historical city of Pakistan. It is also known as the city of SAINTS. It is located in the southern part of the province, and is steeped in history. The total area of the district Multan is 3721 square kilometers. It has a population of over 3.8 million (according to 1998 census), making it the sixth largest city in Pakistan. The City District Government is headed by the DCO. It has six Towns Shah Rukan Alam Town, Shershah Town, Bosan Town, Musa Pak Shaheed Town, Shujabad Town, Jalalpur Pirwala Town. It has three tehsils Multan Sadar, Shujabad and Jalalpur Pirwala . In Multan almost 70% to 80% peoples are attached with agriculture directly or indirectly. The Literacy rate of the District Multan is about 45% that is apparently low but higher than other districts in southern Punjab like Dera ghazi Khan and Khanewal district. The present situation of enrolment at levels of education in Multan district is as follows: 85,266 students are enrolled at preprimary level, 205,084 at primary level, 63,259 in Middle standard, 29,035 at secondary level, and 1,592 at higher secondary. So the total number of enrolment in Multan is 384,236 out of which 216,809 are male and remaining 167,427 are female. This area has been neglected from research point of view especially in education related issues. Due to this negligence and literacy rate situation as compared to other districts, it is necessary to explore the importance of investment in education for District Multan. Therefore, the Multan district is purposively selected to explore the issues related to education for this study.

4. Data and Methodology

4.1 Data Collection and Sources

This study relies on the primary source of data collection by conducting survey from Multan district during the year 2016. Relevant information was collected from all six towns of Multan district including Bosan Town, Shah Rukn E Alam Town, Sher Shah Town, Mumtazabad Town, Shujabad and Jalal Pur Pirwala by using questionnaire technique and focused both urban and rural areas. A sample of 850 wage earners in the age group of 15-65 years was randomly drawn.

4.2 Methodology and Model Specification

This study is based on the human capital model followed by Mincer (1974) that is known as "Mincerian" method or "basic earnings function." It involves using years of schooling (S), the fitting of a function of log-wages (LnW), years of labor market experience and its

square as independent variables. In this semi-log specification the coefficient on years of schooling (*b)* can be interpreted as the average private rate of return to one additional year of schooling, regardless of the educational level. Thus year of schooling refers to

$$\text{Ln } Y = \alpha_0 + b.S + c.t + d.\ t^2 + U$$

$$b = \frac{\partial \ln W}{\partial S} = r$$

In fact, the b coefficient in the above semi-log basic earnings function corresponds to the rate of return to investment in education. This study followed the methodology adopted by Psacharopoulos (1990), Siphambe (2000), Awan and Hussain (2007), Mcnown (2010) and many other studies based on Mincer earning function. Dziechciarz (2011) also discussed the concept and different methods to measure returns to investment in different levels of education particularly tertiary education and about social and private returns of education. The operational model used in this study is as follows:

$$\text{Ln } Y = \alpha_0 + \beta_1 \text{ Total years of education} + \beta_2 \text{ Experience} + \beta_3 \text{ Experience square} + \mu$$

To evaluate the role of medium of instruction in determination of earnings medium variable is added in above mentioned basic earning function.

$$\text{Ln } Y = \alpha_0 + \beta_1 \text{ Total years of education} + \beta_2 \text{ Experience} + \beta_3 \text{ Experience square} + \beta_4 \text{Medium} + \mu$$

In order to investigate the impact of different levels of education on earnings of wage earners extended earning function is used where education is treated as a discrete variable.

$$\text{Ln } Y = \alpha_0 + \beta_1 \text{ Secondary} + \beta_2 \text{ Higher secondary} + \beta_3 \text{ Graduation} + \beta_4 \text{ University} + \beta_5 \text{ Experience} + \beta_6 \text{ Experience square} + \mu$$

4.3 Description of the Variables

Table 1: Description of Some Selected Variables

Variable	**Description of Variable**
Dependent Variable	
Ln Y	Log of Monthly Earnings
Independent Variables	
Total Years of Education	A continuous variable defined as the completed years of education
Primary	Primary level of education is used as reference category
Secondary	=1 if respondent's level of education is up to metric =0 otherwise
Higher Secondary	=1 if respondent's level of education is up to intermediate =0 otherwise
Graduation	=1 if respondent's level of education is up to Graduation =0 otherwise
University	=1 if respondent's level of education is up to M. Phil or PhD =0 otherwise
Medium	=1 if respondent's medium of instruction is English =0 otherwise
Experience	A continuous variable defined as total age of respondent minus total years of education minus five
Experience Square	Experience square

5. Results and Discussion

5.1 Statistical Analysis

Table 2 provides the summary statistics of the descriptive analysis of some selected variables.

Table 2: Descriptive Statistics

Variable	Mean	S.D.
Total years of education	14.94	2.69
Primary	0.0094	0.096
Secondary	0.067	0.25
Higher secondary	0.081	0.27
Graduation	0.24	0.43
University	0.56	0.49
Medium	0.17	0.47
Experience	13.48	10.03

The average total year of education of respondents is 14.94 with 2.69 standard deviation. When different educational levels are taken into account, on the average 0.0094 respondents have education up to primary level with 0.096 variability about mean, 0.067 respondents have education up to secondary level with 0.25 standard deviation. On the average 0.081 respondents have qualified higher secondary level with 0.27 standard deviation, 0.24 respondents having graduation degree while 0.56 persons have university education with 0.43 and 0.49 standard deviation respectively. Medium that is proxy for quality of education showed that 0.17 respondents were studied in English medium institutions with 0.47 variability about mean. The average experience of the respondents is almost 13.48 years with 10.03 standard deviation.

5.2 Econometric Analysis

In this study a comprehensive analysis of the Mincer earning function is obtained. Log of monthly earnings is the dependent variable while the explanatory variables of the earning function comprise of total years of education, experience, and experience square. Along with quantitative aspects of education we also evaluated qualitative aspect of education on earning in the form of medium of instruction in school. The regression results for full sample are presented in table 3, where basic earning function is estimated. All categories had expected sign according to priori expectations and all are highly significant. The coefficient of total years of education showed that one extra year of schooling results in 12.9 percent increase in earning. The coefficient of experience is positive according to expectations showed that earnings increases with income. The coefficient of experience square is negative as expected because it shows the concavity of earning function that implies earning increases with experience but at a diminishing rate. In findings of this study, value of R- Square is low because the people are fairly unpredictable and this study is based on primary data findings and these types of results are also highly important when R-Square value is low but predictors are highly significant.

Table 3: Mincer Earning Function (Full Sample)

Explanatory Variables	Dependent Variable (Ln Y)			
	Coefficient	S.D.	t- Ratio	P- Values
Constant	7.7542	0.1207	64.25	0.000
Total Years of Education	0.1214	0.007146	16.99	0.000*
Experience	0.062964	0.006063	10.39	0.000*
Experience Square	-0.0007901	0.0001545	-5.11	0.000*
R- Square	36.9			
R- Square Adjusted	36.7			
F-Statistic	165.18			0.000

*, **, *** significant at 1, 5, 10 percent respectively in all tables

These results are consistent with the findings of Psacharopoulos (1994) that is 12.8 percent increase in earning on the average year of schooling for Asian countries and 12.5 percent for intermediate countries (Demetriades & Psacharopoulos, 1987) 12.6 percent rate of return was estimated for Phillipines during 1998 (Schady, 2000) and 12.2 percent for China during 1993 (Hossain, 1997). In case of Pakistan our estimated returns are slightly higher than other studies on returns of investment in education in Pakistan, as 10.5 percent returns were estimated for Pakistan by Awan and Hussain (2007) this is due to the regional differences and difference in employment opportunities.

Table 4: Mincer Earning Function of Gender

Explanatory Variables	Dependent Variable (Ln Y)			
	Male Sub-Sample		Female Sub-Sample	
	Coefficient	t- Ratio	Coefficient	t- Ratio
Constant	8.0129 (0.1473)	54.40	6.6719 (0.4274)	15.61
Total Years of Education	0.1152* (0.00769)	14.99	0.17514* (0.0256)	6.82
Experience	0.04850* (0.0080)	6.00	0.05462* (0.0216)	2.52
Experience Square	-0.0005245* (0.000181)	-2.90	-0.0001982 (0.000750)	-0.26
R-Square	36.0		28.8	
R-Square Adjusted	35.6		27.8	
F-Statistic	92.72		27.64	
Probability	0.000		0.000	

Table 4 analyzed the Mincer earning function of gender where we estimated rate of return to investment in education for both sexes separately. In case of men the coefficient on years of schooling in 0.1152 that is positive and significant according to expectations. Similar is the case with experience and experience square, both variables are significant and signs are according to expectations that earnings increases with experience but at diminishing rate.

In case of female the coefficient on years of schooling is remarkably higher than male that is 0.17514 and it is highly significant. The coefficient of experience showed that female earning also increases with experience. In this case the coefficient of the square of

experience is not significant although we expect experience to be an important variable in determining earning but the results here show otherwise. This could be a reflection of wages for female being less tied to experience because women had less cumulative work experience than man as a result of break in their work histories owing to the demand of motherhood and housework traditionally assigned to them. Thus in our findings overall returns of investment in education for male is 12.2 percent while 19.3 percent returns were estimated for female, so the returns of investment in education are higher for female.

Table 5: Rate of Returns of Investment in Education by Gender

Gender	Private Returns
Male	12.2
Female	19.1

Almost similar results were observed in the estimations of various researchers like Awan and Hussain (2007) estimated 9.3 percent returns for male and 18.1 percent return for female in Pakistan. Our results are consistent with international literature also like Siphambe (2000) estimated 12 percent returns for male and 18 percent for female in Botswana. Chiswick (1976) estimated 9.1 percent returns for male and 13 percent for female for less developed countries. Asadullah (2006) evaluated returns for Bangladesh and found 6.2 percent for male and 13.2 percent for female.

Although female earnings are low as compared to male irrespective of same education, our results suggest that additional investment made in female education have higher marginal returns than male. Doughterty (2005) argued that returns for women are higher than men because education helps women to find employment outside the traditional low paying female occupation.

Table 6 shows returns of investment in education for individuals located in urban and rural areas of Multan district separately. The coefficient of years of schooling for urban respondents is positive and highly significant, that showed one year increase in education for urban residents leads to 13.4 percent increase in earnings. Experience and experience square both are significant and had priori expected signs.

Table 6: Mincer Earning Function of Region

Explanatory Variables	Dependent Variable (Ln Y)			
	Urban Sub-Sample		Rural Sub-Sample	
	Coefficient	t- Ratio	Coefficient	t- Ratio
Constant	7.6409 (0.1569)	48.71	7.9837 (0.1885)	42.36
Total Years of Education	0.1258* (0.00953)	13.20	0.1128* (0.0106)	10.64
Experience	0.0718* (0.00776)	9.26	0.04554* (0.00966)	4.71
Experience Square	-0.001009* (0.000199)	-5.07	-0.000362 (0.0002429)	-1.49
R-Square	37.6		36.7	
R-Square Adjusted	37.3		36.0	
F-Statistic	109.30		57.54	
Probability	0.000		0.000	

Table 7: Rate of Returns of Investment in Education by Region

Region	Private Returns
Urban	13.4
Rural	11.9

In case of rural respondents the returns of education are slightly lower that is 11.9 percent. This is because of the expectations that people living in urban areas have more opportunities to exploit skills acquired through higher education than do those living in rural areas. These results are consistent with the findings of Warunsiri & Mcnown (2010), Asadullah (2006) and Khan & Toor (2003).

Table 8 represents the returns of investment in education disaggregated by marital status. All findings are significant and had expected signs. The coefficient of total years of education in case of married respondents is 0.115 while in case of unmarried respondents it is 0.130 that showed returns to investment in education for married respondents is 12.2 percent while for unmarried respondents it is 13.9 percent. The coefficient of experience in both cases showed that earnings increases with experience for both married and unmarried respondents.

Table 8: Mincer Earning Function of Marital Status

Explanatory Variables	Dependent Variable (Ln Y)			
	Married Sub-Sample		Unmarried Sub-Sample	
	Coefficient	t- Ratio	Coefficient	t- Ratio
Constant	8.0129 (0.1473)	54.40	7.4844 (0.2655)	28.19
Total Years of Education	0.1152* (0.007691)	14.99	0.1303* (0.0155)	8.39
Experience	0.04850* (0.04850)	6.00	0.09199* (0.01925)	4.78
Experience Square	-0.0005245* (-0.0005245)	-2.90	-0.002034* (0.00088)	-2.31
R-Square	36.0		20.7	
R-Square Adjusted	35.6		20.0	
F-Statistic	92.72		29.78	
Probability	0.000		0.000	

Table 9: Rate of Returns of Investment in Education by Marital Status

Marital status	Private Returns
Married	12.2
Unmarried	13.9

These findings are consistent with the estimation of Warunsiri and Mcnown (2010) where returns for married persons were 11.2 percent while for unmarried persons returns are 12.6 percent. Returns of investment in education are higher for unmarried workers because they have greater geographical and job mobility which allows them to take advantage of greater potential earnings afforded by higher levels of education.

Table 10 represents returns to different levels of education, where primary level of education is used as reference group to avoid dummy variable trap, thus we observed that signs of all coefficients are significant and according to priori expectations. Thus on average secondary level of education has 0.21 units higher earning as compared to primary level of education. Similarly worker with higher secondary level of education have 0.37 units higher earning while a graduate degree holder has 0.59 units higher earnings. In case of university education returns are highest as 1.0059 units more as compared to reference category. These results are consistent with previous studies.

Table 10: Returns of Investment in Different Levels of Education

Explanatory Variables	Dependent Variable (Ln Y)			
	Coefficient	S.D.	t- ratio	P- Values
Constant	8.7870	0.1120	78.47	0.000
Secondary	0.2130	0.1220	1.75	0.081***
Higher secondary	0.3724	0.1204	3.09	0.002*
Graduation	0.5926	0.1089	5.44	0.000*
University	1.0059	0.1058	9.51	0.000*
Experience	0.0659	0.006246	10.55	0.000*
Experience square	-0.0008696	0.0001601	-5.43	0.000*
R- Square	34.2			
R- Square Adjusted	33.8			
F-Statistic	73.17			0.000

In order to estimate returns to investment in quality of education we used basic earning function (1974) with quality of education variable while Card and Krueger (1992) examined the effect of school quality on returns to education by using student-teacher ratio, average term length and relative pay of teachers as proxy for quality of education. Awan and Hussain (2007) used private schooling as a proxy for quality of education and estimated that private schooling showed higher returns as compared to public schools. Khan and Toor (2003) and Jamal, Toor and Khan (2003) used private schooling and English as a medium of instruction as proxy for quality of education and examined a significant role of English medium of instruction.

Table 11: Mincer Earning Function (Full Sample)

Explanatory Variables	Dependent Variable (Ln Y)			
	Coefficient	Standard Deviation	t-Ratio	P-Values
Constant	7.7356	0.1210	63.92	0.000
Total Years of Education	0.12122	0.007138	16.98	0.000*
Medium	0.06634	0.03852	1.72	0.085***
Experience	0.06422	0.006100	10.53	0.000*
Experience Square	-0.0008159	0.0001551	-5.26	0.000*
R- Square	37.2			
R- Square Adjusted	36.9			
F-Statistic	124.92			0.000

In basic earning function we incorporated another explanatory variable that is medium and found that it is highly significant and had a positive sign which shows that English medium plays a very important role in determining returns to investment in education and earning increases when we get education from an English medium school.

Table 12: Mincer Earning Function by Medium of Instruction

Explanatory Variables	Dependent Variable (Ln Y)			
	English Medium Sub-Sample		Urdu Medium Sub-Sample	
	Coefficient	t- Ratio	Coefficient	t- Ratio
Constant	7.0600 (0.5965)	11.84	7.7912 (0.1177)	66.17
Total Years of Education	0.15617* (0.03468)	4.50	0.119030* (0.006963)	17.10
Experience	0.10492* (0.02501)	4.19	0.06034* (0.006136)	9.83
Experience Square	-0.0017935* (0.0007127)	-2.52	-0.0007278* (0.0001535)	-4.74
R-Square	26.4		40.9	
R-Square Adjusted	24.7		40.6	
F-Statistic	16.12		162.77	
Probability	0.000		0.000	

In table 12 researchers estimated basic earning function separately for English medium schooling and Urdu medium schooling and found that all variables are significant and signs are according to priori expectations. In both cases returns increases level of education and experience, thus overall returns to investment in English medium schooling are 16.9 percent while for Urdu medium schooling returns are 12.6 percent. Thus English language is a significant indicator of earning differential in Pakistan's labor market.

6. Conclusion and Suggestions

This study conducted a micro analysis of returns to education using random sample from Multan district of Pakistan. The analysis of complete sample by using Mincer earning function showed a positive and significant role of education in earnings of wage earners. Female education is more rewarding in form of earning as compared to male because education helps them to get highly paid jobs. Due to better opportunities and skill enhancing activities education returns are higher for urban wage earners as compared to rural wage earners. In case of marital status unmarried wage earners have higher returns as compared to married respondents due to greater chances of geographical and job mobility. In case of dummy variables for different levels of education where primary level of education is used as reference category we found that returns to education increases with levels of education. To examine the role of quality of education we found that wage earners whose medium of instruction was English get higher returns as compared to other mediums because of greater use of English language at professional level.

In view of this analysis we found that more effective policies should be designed to increase access, enrollment and completion at all levels of education. Better employment and skill enhancing opportunities should be provided in rural areas also to increase returns for respondents in rural areas and to reduce population burden in urban areas of Pakistan. Moreover role of English medium especially at primary and secondary level

should be promoted in private as well as public institutions for better performance of workers in all fields. This type of study can be conducted in future by using internal rate of return method if data regarding cost of education is available at micro level, moreover quality of education can be estimated by father's education or student teacher ratio as proxy variables. Estimation of non-monetary returns to investment in education in Pakistan can also be a great and novel contribution for future research.

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