Application of Mincerian Equation to the Higher Secondary Schools Teachers in District Abbottabad, KP, Pakistan

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Abstract

This study is some sort first in the area investigates the statistical and Econometric relationship of academic years, experience and income. The schooling is a very significant determinant of personal income based on experimental and academic studies. Study tests the application of Mincerian equation to the higher secondary school teachers of district Abbottabad, KP Pakistan. The study is based on cross-sectional data of the year 2022. Data collected from the (Education Directorate Office Abbottabad. This study used a sample of 250 teachers. Log-linear model used for the estimation of parameters. and to concludes the results of regression. Results reveal the positive association of income with education and job market experience. Higher education has the greater contribution in income comparatively experience and academic years. One-year increase in higher education results 7 % increase in income level. The higher education returns for male teachers is 6% while for female 10%. The policy recommendation is to improve and invest in higher education.

Keywords: Mincerian Equation, Income, Higher Education, Experience, Log-Linear Model

Introduction

The positive association between academic years and labor market earnings is well established relationship in labor economics. This argument of building human capital by schooling and training is more used for poverty reduction policy makers in developing world (Solangi et al., 2015). More than the last half century labor economics has undergone a principal change. Labor economists presented that labor is a collection of diverse human beings having different skills and job efficiencies. These days labor economists stress on how economies improve worker efficiency employee-by-employee in the course of inspiring workers to attempt and to invest in human capital (Mohsin et al., 2004). Issues that manipulate a person's income have a long tradition. Most writers have accomplished that education is an extremely important determinant of labor remuneration, based both on experimental and academic studies. In the similar way, the majority of econometric studies on this topic are based on human capital theory, dignified by (Becker, 1962) due to its advantages in clarification and experimental verifications. Because of these reasons, considering in mind education as the main determinant of individual income has extensive academic support.

Human capital approach suggests that workers have higher income who has visited schools and other forms of educational institutes than those workers who do not invest in their education (Romer, 1989). An influential work done by Jacob Mincer in 1974 has made a great contribution in evaluation of a wage equation where the log-log model represents hourly wage is function of education years, experience, and squared of experience. In this

context, the coefficient of academic years is interpreted as the expected gains from one more academic year in terms of increased wages. The basic model explains the theory of human capital (Mincer, 1974).

The earning potential of a person comes from the knowledge gained in each year of schooling and experience. The marginal return from education gives the percentage growth in income as per dollar investment in educational years. The slope of the wage ($\Delta w / \Delta s$) determines by how much earnings increase if the person stays in school one more year (Borjas, 2005). Human capital is based on two ways: one is education and second one is learning by doing or job experience. It is difficult to quantify human capital: similarly, a person's working potential is also hard to measure. But the level of education is generally perceived as an important indicator and good alternate variable (Shuaibu, 2016).

Education is a valuable investment in human capital because it puts together human potential, which is a very fundamental component in building nations. Without gaining a convinced level of literacy, one cannot think of satisfying the vision of socio-economic expansion of the country. Education plays a very important function in the formation of human capital as human capital theory suggests an educated person possesses high efficiency and high level of ability competence as contrast to an uneducated person. Economic growth is not achievable without education as it is a significant feature in the progress of a nation (Mohsin et al., 2004).

Investments in education are estimated by rate of returns to educational investments. This helps to boost labor market earnings that are associated with marginal return to education yearly. The individuals acquire benefits from higher level of education in term of higher earnings. These externality benefits include higher growth rates, improved living standard and great civic, social and political participation (Tansel, 2017). Earnings boost with each extra year of schooling, it offers more skills and technical abilities that show the way to increase the earnings level. There are some other factors that might be associated with education and earnings, e.g. inherited abilities. Wage distinction among the more and less educated are merely the compulsory reimbursement to adjust for the additional costs gained in receiving more human capital (Krueger & Lindahl, 2001).

Teachers constantly help to change society via improving the standard of living of persons in the perspective of a quickly altering prospective and rising uncertainties. The request made to upgrade and improve their knowledge and experience (Araujo et al., 2016). Teachers can help to motivate people and society to provide those capabilities, inspiration, and tools mandatory for long-lasting learning. They are requested to realize and made better educational reforms systems (Chetty et al., 2014).

Experience endorses efficiency level, and it is attained over time which enhances the skills, knowledge and productivity level of teachers. Teachers are untired and unselfish driving force of transformation and improvement as well as custodian of tradition. Professional obligation, care and love for students are some qualities which are associated with teachers (Rice, 2013).

Education is an investment like financial investments and people make investment in education where it is based on cost and expected profits in term of earnings. Education is not effortlessly accessible and as a result there is a need to allocate educational resources. Education relay upon human resources, which is essential for economic and social changes (Burnell, 2017). It is generally established that education generates better citizens and helps to increase societies living standard. Consequently, constructive social revolution is related to the qualitative community (Olaniyan & Okemakinde, 2008).

Education is consumer good, and everyone has basic right to attain education. It is well identified that earning is a multifaceted procedure in which numerous factors get involved. Usually, the factors are clustered on two bases: job characteristics and worker characteristics. Practically, it seems that wage determination depends more on employee characteristics than on job characteristics. The former is very subjective, while the latter are comparatively easier to describe and to compute. Education has a key role in an individual's life and prosperity of societies. It is a primary factor of employment and economic progress of advanced economies. Ignoring the new economic dimension of educational systems would lead to compromise the prosperity of future generations by consequences of future poverty and deprived social security systems. There is essential need to focus on reforms in educational systems and outcomes, rather than realization (Woessmann, 2016).

From the point of view of the human capital theory, education is a necessary part in investment of human capital and building unit also, that will support the equivalent allocation of income (Schultz, 1960) and (Becker, 1962) Based on educational strength and development, it was realized that the growth in education help to reduce the income inequality gap however, it is calculated by the adjustment of labor demand curve with the development (Ahluwalia, 1976) and (Knight & Sabot, 1987). Yet, income differs within built factors even if extrinsic circumstances (such as education, business, and line of work, service and region) are like.

Objectives of the Study

This study explores the relationship among education, experience, and earnings. For this very purpose we have selected teachers at higher secondary schools in the district Abbottabad as the target segment. This study analyzes whether the schoolteachers are being compensated with increased qualifications.

1.   To estimate the impact of academic years on income of the higher secondary schools' teachers.
2.   To estimate the impact of higher education on the income of the higher secondary schools' teachers.
3.   To estimate the impact of experience on the income of the higher secondary schools' teachers.

Significance of the study

This study explores the statistical relationship between academic years, experience, and income among higher secondary school teachers in Abbottabad District, KP Pakistan, using the Mincerian equation. Utilizing cross-sectional data from 2022 and a sample of 250 teachers, the research reveals a positive association between income, education, and job market experience, with higher education contributing more significantly to income levels than experience. Notably, each additional year of higher education results in a 7% increase in income, with male teachers experiencing a 6% increase and female teachers a 10% increase. These findings, being the first of their kind in this region, have important policy implications, highlighting the need for greater investment in higher education to boost economic benefits and reduce gender income disparities. The study provides a data-driven basis for educational policy improvements and serves as a benchmark for future research in educational economics in Abbottabad District.

Literature Review

In the past a range of research writers carried out their research on the relation of schooling, and experience as the problem under their consideration. Ramessur and Jugessur (2024) assesses the relevance of the Mincerian Equation in Mauritius. Using CMPHS data, the basic equation is augmented to cater for wage responsiveness to changes across different schooling levels. However, the use of the standard linear regression method does not take into consideration the endogeneity of the variable years of schooling and sample selection bias (Cappelli, Ridolfi, & Vasta, 2023). In the context of education and human capital theory, skills, broadly speaking, refer to the knowledge and capabilities students acquire that prepare them for future learning and successful performance in the workplace. Quispe-Mamani, Hancco-Gomez, Carpio-Maraza, Aguilar-Pinto, Mamani-Flores, Flores-Turpo, and Alegre-Larico, (2022) applied the Mincer equation for thr impact of education on the houshold's income in Peru

Becker (1962) proposed that schooling or training move up the efficiency of personnel by attaining valuable information and abilities i.e. education is associated to worker's efficiency. Human capital theory proposes that education or training uplifting workers' future living standard by raising their lifetime income. The results draw a vital difference between all-purpose education and firm-specific training.

Mincer (1974) made analysis on the relationship of additional year of schooling and log of personnel earnings. This study found that the time spent in school is the most attributing determinant of earnings. This study empirically proves that education has more explanatory power along with years of experience for same clusters. The years of experience without considering the age interpreting the variation level in earnings. Card, (1999) argues that schooling perform a vital role in current markets. A lot of research done in different time and countries established that well-educated person be paid privileged earnings, subject to less joblessness, and work in more high-status professions than their less-educated equivalents.

Chen and Hamori, (2009) aimed to investigate the economic return to schooling. This study used data from China Health and Nutrition Survey questionnaire that covers 288 villages. This study is based on the Mincer equation model. By using OLS (ordinary least square), instrumental methodologies, logit and probit model the results exhibits that economic return to schooling for men is slightly greater that is 8.06% than comparable for women that are 7.67%. This paper suggests that educational policies should be made specifically for rural dwellers and help to facilitate the rural employment level.

Salehi-Isfahani et al. (2009) explored the returns to education of urban cities for three countries which are Iran, Egypt and turkey. This study covers the time period 1980 to 2006 by selecting the sample aged between 20 to 54 years. Existing markets focus on secondary and higher education rather than technical and vocational income. Except Turkey rest of two countries shows the lower returns to vocational education and higher for academic years. The results exhibit the increasing returns for schooling years. Păuna (2009) estimated the mincer model for the years 1995 and 2000. The result contradicted mincer theory and shows the negative relationship between education and income. The outcomes for male and females' sample are 5.9% are 7.18% in 1995. In 2000 the values are 8.3% and 9.75 respectively. On the other hand. this represents that Romanian labor market has increased the level of attainment of education.

Warunsiri and McNown (2010) investigated the educational returns for Thailand for time span 1964 to 1967. The sample selected those who born between 1964 to 1967. The results show that there are returns for education to overall analysis is 14% and 16%. The women's have greater returns as compared to males. Moreover, employee belongs to urban areas have greater returns to education as relatively rural areas. Akgüç (2011) used log-linear function to estimate the different educational level primary, secondary and higher for wages. The data gathered from a survey regarding observed variables for analyzing Mincer equation. The results demonstrate that different levels of education is significant in the relation to income and output per employee. This study also confers that higher education is the dominant element in all educational levels. The level of returns is significant and lies between 11 to 13 %.

Güriş and Çağlayan (2012) employed the mincer wage equation and robust regression to analyze the returns to education, experience, and gander for the dependent variable wages. This study used ordinary least square for analyzing Turkish data. The results exhibit the returns to educational years and returns to experience are greater for female employee as compare to males in years 2003 and 2006. Harberger and Guillermo-Peón (2012) examined the association between duration of educational years and wages for Mexico. The study analyzes the benefits obtained from primary schooling, high schooling, and higher education for the survey data over the year 2010. The result demonstrates the confirmation of net present value and returns to investment concerning consecutive steps of educational grading.

Purnastuti (2012) explored the private returns to education for Indonesia by employing Indonesia Family Live Survey data. The study specified that returns to education for females are statistically significant and greater as compared to returns to education for male employees. By employing OLS and Mincer model this study shows an extra year of education increase the employee salary by 566%. This study suggested to increase the investment in educational attainment. Ion (2013) calculated the returns to education relationship to income in 2009 for Romania. This study based on Mincer model and used OLS. The sample observation is 16,570. The returns to males are higher 26.58% than females because the sample observations for male are more than females. The variables included in the analysis are experience, squared experience workplace and gender in a relationship to income. The results indicate returns for educational years are 11.29%. The results demonstrate the positive change towards educational attainment as value of returns to education improved over the last few years which shows the society altered by giving importance to knowledge and skills.

Wannakrairoj (2013)analyzed the link among education, experience, and wages for urban and rural dwellers for Thailand. This study used cross-sectional data from 19,000 employees. By employing OLS regression this study confirms the positive relationship between experience, education, and income of employees for both markets. Moreover, experience has more diminishing returns for urban as compared to rural markets. This study used the mincer model and suggested improving the education level.

Magdalyn (2013) inspected the relationship of experience, experience square and duration of education on income of the employees. This study analyzed the mincer model by using survey that covers the 206 households and 726 workers in the year 2012. The result shows that increase in education leads to increase income by 778.68 and the returns for female are higher than males. The returns to education for urban are higher than rural areas. The returns to education are higher for married as compare to unmarried individuals. Comola and De Mello (2013) investigated the factor effecting income for Indonesian economy. The study employed OLS and Mincer model for analysis. The results demonstrate that educational qualification, age increase income and the results show higher returns for male as compared to females. The data gathered in this study about 75.371 households or 237 employees. The people having high education does not prefer low salaried jobs and education is dominant factor in labor market.

Purnastuti et al. (2013) made comparison regarding the education levels and their corresponding wage rates for Indonesia economy. The return to education is decreasing between the time span 2007 to 2008. This irregular growth pattern would be improved or change into profitability by increasing the demand for qualified graduates with different level of schooling. Okletey (2013) investigated the relation among different educational years and earning for Ghana. This study employed Mincerian equation and OLS method. The results confirmed the direct and positive returns to duration of years to the earnings level of employees. The results exhibit disparity in returns to education for gender. The returns to education for female are twice higher than male. Moreover, the agricultural sector has a higher return compared to nonagricultural sector.

García-Suaza et al. (2014) inspected the rate of returns to higher education in Colombia. This study used Colombian survey data from 2001 to 2005. This study employed cost benefit analysis and internal rate of return (IRR) that used a measure the profitability of investment in education. The technical and vocational higher education has positive return and increases the gender gap. The results reveal that return to higher education and efficiency rate are different lies between 0.074 and 0.128 for gender and significant differences found for gender in Colombian market. Varly et al. (2014) estimated the primary, secondary, and high level of educational returns and impact on earnings. This study employed the survey data and Mincerian model. The results show that returns to duration of schooling years are 7.9%. the returns for 14 years of education are 51% and for higher level PhD is 42%. Saqib et al. (2016) studied the impact of education, experience, skills, and income for Nowshera, Pakistan. This study inspects the observe relationship by using Simple and multiple regression that is estimated by OLS. The results exhibit that education and experience are significant factors while skill is insignificant. A unit increase in education and experience variable results increase in 563.94 rupees and 899.59 rupees in earnings respectively. This study suggested that government should promote vocational and technical education that would increase the skills level for improvement of earnings and eradicate the unemployment level. Tansel (2017) investigated the impact of educational expansion on educational outcomes and return to education based on gender whose age from15 to 64 for Turkey. This study used data from a household labor force survey conducted over the years 2002 to 2015. By using instrumental variables method, OLS and 2SLS techniques the results indicate casual effect of education on earnings. The result exhibits that there is found statistically positive return to education for both comparatively less for female and greater for male. This study suggested to policy makers that there might be made investment in education diversely.

Aydemir and Kirdar (2017) investigated the returns from education for males and females over the Turkish survey data that is collected by making birth cohort regarding the1997 educational reforms. The result demonstrates the returns to an additional year of schooling is almost 7–8% for females and for males these returns are 2–2.5%. Ismail and Awang (2017) aimed to examine the link among performance of teachers based on their professional education, training, experience, and earnings for Malaysian economy. This study employed secondary data collected from a national survey (2012) which covered 400 primary and secondary schools. 8,000 questionnaires were also distributed 8,000 questionnaires among teachers with the rate of return is approximately 84%. This study used cost benefit analysis and survey method directed by the human capital theory. The results show that the education of teachers is highly correlated with experience and earnings level. The private rate of return of teacher's income regarding each additional year of education found between 3% and 4 % per year.

Limam and Hafaiedh (2018) inspected the determinants of income, examining the private returns of education and heterogeneity problem associating these returns for Tunisia. This study used data from Tunisian Labor Market Panel Survey (2014) and 1561 respondents participated aged 15-64. By using interactive model, the results indicate education is key determinant of private returns and these returns increase systematically with the levels of education. This study recommends schools to work conversion plans that will increase employment and earnings. This study also gives directions to support the role of community policies regarding the reduction of inequality in opportunities for both years of education and income.

Wang and Wu (2018) analyzed the returns of education for rural and urban areas in China. This study used Mincer's model for calculation of rate of return of education. OLS was used for regression analysis. The empirical results indicate that rate of returns to education overall is (13.9%) which shows the value of education increasing day by day. The returns of education for rural area were (3.7%) and for urban area were (25.6%). The results for gender equality exhibit that returns for education of female is 9.1% which is significantly greater than males that are (2.5%) in rural areas. This analysis presented the results for educational investment, educational inequality based on gender and areas.

Patrinos et al. (2019) used Mincerian equation and finds out the association between years of education and wages for Turkey. This study gathered data from a survey and includes 400,000 peoples in analysis. This study employed OLS and outcomes show the return from Primary 39%, Secondary 34%, and Higher education are 16%. Females returns to education are greater from males. Return to education are higher for public sector compared to private sector.

Human capital Theory and Mincerian equation

The Human Capital Theory, developed by economists such as Gary Becker and Theodore Schultz, posits that individuals invest in education and training to enhance their productivity and future earnings, akin to investments in physical capital. The Mincer equation, formulated by Jacob Mincer, quantifies this relationship by linking earnings to years of schooling and work experience. The equation typically includes terms for the natural logarithm of earnings, years of schooling, and both linear and squared terms for work experience to capture diminishing returns. This model empirically validates Human Capital Theory by showing that each additional year of education and experience increases earnings, though at a decreasing rate for experience. The empirical results from the Mincer equation underscore the importance of educational investments and provide valuable insights for policymaking aimed at enhancing workforce productivity and earnings potential through education and training programs.

Fig: 01 Conceptual framework
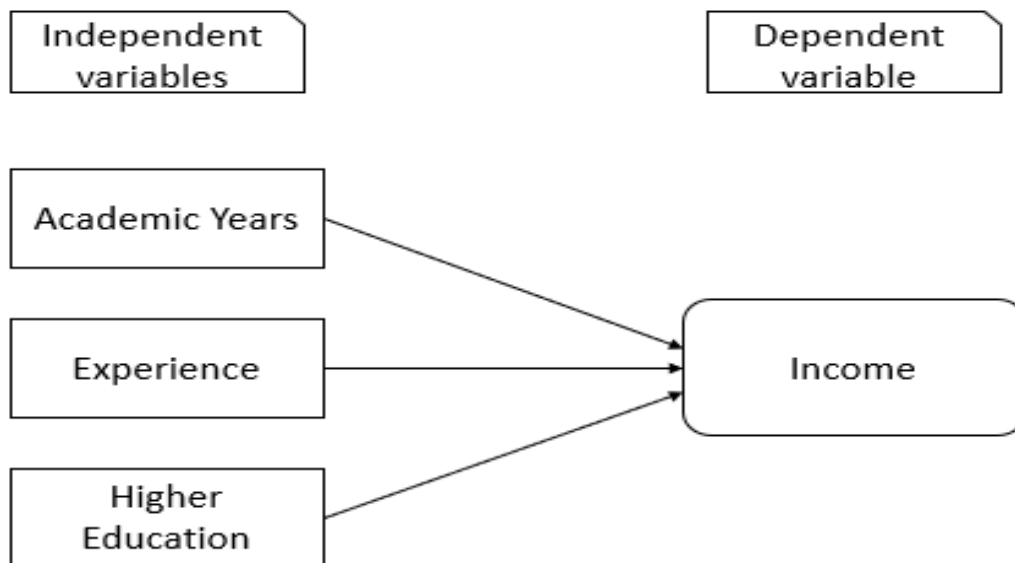
Data and Methodology

Sampling Techniques

Sampling technique from survey system .com is applied for the proportionate sample of male and female teachers.

Model Specification

This study uses regression analysis. The aim of this analysis to test empirically the relationship among academic years, job market experience and earnings, and to test it earnings or income is a dependent variable in the study while academic years and job market experience are the independent variables. This study used (Mincer, 1974) earning model as the base of our study which has been subsequently followed by many researchers in different parts of the world. (Mincer, 1974) function is using to identify the relationship between the education, job market experience, job market experience and income. Following is Mincer's earning function:

Income= f (education, job market experience, job market experience squared)

Equation form

$$LnW_i = \beta_0 + \beta_1 SCH_i + \beta_2 EXP_i + \beta_3 EXP_i^2 + \mu_i \ldots\ldots\ldots\ldots.. \text{ (Mincer, 1974)}$$

Based on earlier discussion, the following regression model is identified for estimation. The model used in this study is given below:

$$\text{Log } (Y)_i = \alpha_0 + \alpha_1 (Acd\ Years)_i + \alpha_2 (Exp)_i + \alpha_3 (Higher\ edu)_i \ldots\ldots.equ(1)$$

logarithm is taken for income that is independent variable and the dependent variables are academic years, experience and higher education. This is log linear model for the analysis of Mincerian equations. α_0, α_1, α_2, and α_3 are the parameters.

Why we use log-Linear model

In summary, the log-linear model is preferred because it linearizes the exponential growth of earnings, allows for easy interpretation of coefficients, captures diminishing returns, reduces heteroscedasticity, helps in achieving normally distributed errors, offers flexibility in model specification, and enables comparative analysis across studies. These advantages make it a powerful tool for understanding the impact of schooling and experience on income.

Variables

Based on hypotheses, we have developed variables. The variables which are included in the study are dependent and independent variables. To analyze the effect of education and job market experience on earnings, education and job market experience are used as independent variables and earnings as dependent variable.

Hypotheses of the Study

The hypothesis of the study based on the literature review, is that there is a positive relationship between earnings, education and job market experience. The hypotheses of the study are:

Hypothesis 1: *There is a positive relationship between academic years and income of the higher secondary schools' teachers.*

Hypothesis 2: *There is a positive relationship between higher education and income of the higher secondary schools' teachers.*

Hypothesis 3: *There is a positive relationship of experience and income of the higher secondary schools' teachers.*

Sampling

The total population of higher secondary school teachers is 712. The female teachers constitute 313 while the male's teachers are 399. Sample is taken 30 % which is best representative of the population. Sample is representative sub part of population. The 250 teachers selected for sample which is 30 % of total population.

This study employs proportionate sampling for males and female. So, randomly selected female sample is 110 and male sample is 140. This study used Cochran, (1977) for selection of the sample size.

Data Collection

The current study about the relationship between income, education and experience is based on the secondary school teachers of the district of Abbottabad. The data is collected from a sample of 250 through the monthly staff statements, which is the source of secondary data provided by the education directorate office of Abbottabad. This study used cross-sectional data for the analysis. The time for which the data was collected for the variables for 2021.

Results and Discussion

Descriptive statistics

Descriptive statistics is out lay of the actual data represented by mean, median, minimum and maximum. Frequency distribution tables and graphs were used in analysis to find the conclusions. These results are interpreted as follows.

Table:1 Descriptive Statistics

Variables	Income	Acad years	Exp
Mean	72968.32	15.20	20.12
Median	72000	16.00	22
Maximum	155000	22.00	39
Minimum	23800.	12.00	1
Std. Dev.	28205.62	1.603	10.18
Obs	250	250	250

The value of mean is average of the whole data values for considered variables of the study. Median is the mid value in the data. The central tendency is quantifying by mean and median. The maximum value exhibits possible outlier to the extreme end. The minimum value exhibits how much data is spread out up to the lowest end. The data is symmetrical or asymmetrical is analyzed by skewness. The measure of dispersion is shown by the standard deviation.

The table demonstrates the mean value for academic schooling years is 15.20 and median is 16. The maximum number of academic years in our sample is 22, while minimum is 12 educational years. The total figure of observations is 250. The standard deviation for academic years is 1.603. The mean value for experience is 20.12 and median is 22. The maximum number of years of experience in our sample is 39 while the minimum is 1.

The mean value for income is 72968 and standard deviation value is 28205.62 The median for income is 72000. The maximum value for income in the sample is 155000 and whereas the smallest value is 23800.

Correlation Analysis

Correlation analysis indicates both the nature and strength of the relationship between two variables. Correlation analysis exhibits positive (direct relationship) or a negative (inverse relationship). It is a statistical technique to define the degree to which one variable is linearly related to another variable. The correlation coefficient r measures the strength of linear association. The value lies between -1 to +1. The value of r closer to +1 or -1 indicates the direction positive or negative and strength strong or weak of the relationship. The value closer to 0 indicates no relationship. This study analyses correlation analysis to assess the association between the predictand and the independent variables.

Table:2 Correlation Analysis

Variables	Ln income	Acad years	Exp
Ln income	1.000000		
Acad years	0.226075	1.000000	
Exp	0.767419	-0.106068	1.000000

The results from the correlation analysis among the predictand variable income and the independent variable for higher secondary school teachers analyzed. The relationship between income and education was found positive as the value 22% association between academic years and income.

Similarly, experience has a significant positive relationship with income. Although the relationship is less significant as compared to the relationship between income and education. The coefficient value of correlation for experience is 0.76 indicates the 76% association between experience and income of higher secondary school teachers. While there is found negative association between experience and academic years.

Regression Analysis

OLS is a statistical method for analyzing variables. It helps to understand how predictand variable fluctuates with respect to change in the independent variable. It comprises many techniques for modeling and analyzing observed variables of the model. This study analyzed how dependent variable income changes due to change in independent variables academic years, experience and higher education.

Table:3 Ordinary Least Square for whole sample

Dependent Variable: LNINCOME				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Acad years	0.015172	0.007588	1.999580	0.0466
Exp	0.014193	0.000629	22.55231	0.0000
Higher edu	0.075854	0.024466	3.100432	0.0022
C	4.268473	0.105739	40.36791	0.0000
R-squared	0.696411	Mean dependent var		4.828087
Adjusted R-squared	0.692709	S.D. dependent var		0.181321
S.E. of regression	0.100513	Akaike info criterion		-1.741185
Sum squared resid	2.485312	Schwarz criterion		-1.684842
Log likelihood	221.6482	Hannan-Quinn criter.		-1.718509
F-statistic	188.1021	Prob(F-statistic)		0.0000

The first independent variable is academic years. This variable has a positive and direct association with the individual's earnings. This could be interpreted as a change in one year of education or schooling brings the change 0.015 points or 1% in income. Our regression results lead us to conclude that an additional year of academic education of schoolteachers leads to an increase in their salaries. It is explicitly evident that the value of coefficient is significant at 1% and shows the direct relationship with earnings. This confirms the first supposition of the study that there exist positive association between education and earnings. The results are similar with the study of Ismail and Awang (2017).

Mincer exhibited the positive and direct link of years of education and market working experience not for the reason that they are essentially complementary to each other, but it related to the capital accumulation e.g. the personal who invest in both pillars of human capital. Experience is also significant at 1% and illustrates a direct association with the individual's earnings. This could be interpreted as a change in one year of experience brings the change 0.014 or 1%. This means that as the experience of schoolteachers increases by one year it raises the income by 1%. The results are similar with the results of Wannakrairoj (2013) which analyzed the link among education, experience and wages for Thailand.

The coefficient of higher education is 0.075 that shows the positive relationship between higher education and income. This value demonstrates that if a person having additionally one year of higher education that would leads to increase the income by 7 %. This result consistent with the study of Varly et al. (2014) that exhibits that returns to primary schooling years are 7.9%. The returns for 14 years of education are 51% and for higher level PhD is 42%.

Statistic R^2 provides the model's goodness of fit and shows the statistical measure of the association between variables. The value of R-square of the model is 0.696 which shows that independent variables explain the variations in income by 69%. The value of adjusted R-squared for our model is 0.692 which has a very small difference from the value of R-squared, which indicates that the sample size is large. The value of R-squared adjusted shows the relevancy of the independent variables to dependent variables in a relationship. In our analysis the F-statistic is 188.10 with the p-value of .000 or 1% level of significance. Hence, we conclude that there is a significant association between the predictand and the independent variables.

Table:4 Ordinary Least Square for Male teachers' sample

Dependent Variable: LNINCOME				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Acad years	0.021062	0.010692	1.969906	0.0509
Exp	0.014267	0.000800	17.83990	0.0000
Higher edu	0.064318	0.035391	1.817360	0.0714
C	4.167913	0.149451	27.88810	0.0000
R-squared	0.708322	**Mean dependent var**		4.828894
Adjusted R-squared	0.701888	**S.D. dependent var**		0.188180
F-statistic	110.0894	**Prob(F-statistic)**		0.000000

Table:5 Ordinary Least Square for female teachers' sample

Dependent Variable: LNINCOME				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Acad years	0.008536	0.010550	0.809045	0.0023
Exp	0.014556	0.001049	13.87400	0.0000
Higher edu	0.101191	0.033056	3.061220	0.0028
C	4.368493	0.145680	29.98691	0.0000
R-squared	0.705748	**Mean dependent var**		4.827060
Adjusted R-squared	0.697420	**S.D. dependent var**		0.173046
F-statistic	84.74528	**Prob(F-statistic)**		0.000000

The table 4 and 5 indicates the results of regression for female and male samples separately. The results show that academic years, experience and higher education has positive impact on income for both samples. The higher education explains 6% variation in income for male teachers while the returns of higher education are more for female teachers which is 10% and results are significant at 1%,5%, and 10%. The models are significant by showing the values of F-statistics and probability of F- statistic.

Our regression results lead us to conclude that an additional year of academic education of female schoolteachers leads to an increase in their salaries. The results are similar with the results of this study Purnastuti et al. (2013). The experience of female schoolteachers increases by one year it raises the income by 1%. The results are similar with the results of this study Magdalyn (2013). This study covered 206 households and 726 workers. The result shows that increase in experience leads to increases income by 778.68. The coefficient of higher education in present analysis is 0.10 that shows the positive and strong relationship. This result consistent with the study of Harberger et al. (2012).

The academic years has positive and direct association with the individual's earnings in male teachers' sample. The returns to education years are 2%. The results are similar with the results of Patrinos et al. (2019). This study's outcomes show the return from Primary 39%, Secondary 34% and Higher education are 16%. Experience is also a significant indicator and illustrates direct association with the individual's earnings in current analysis. The results are similar with the results of Saqib et al. (2016) which shows that a unit increase in education and experience results in 563.94 rupees and 899.59 rupees increase in earnings respectively. The coefficient of higher education is 0.06 that shows the positive and strong relationship between higher education and income in our

analysis. This result consistent with the study of García-Suaza et al. (2014). The results reveal that return to higher education lies between 7% to 12%.

The outcomes of returns to higher education for both males and females are comparable by the literature studies. The outcomes of higher education for females are higher as compared to males' teachers at higher secondary schools in district Abbottabad. The education returns for female is 10% while for males it is 6 %. The findings are similar with the findings of Aydemir and Kirdar (2017) investigated the returns from education for males and females over the Turkish survey data. The result demonstrates 7–8% for females and for males these returns are 2–2.5%. The findings of Wang and Wu (2018) are supported our results where this study analyzed the returns of education for China. The empirical results indicate that the rate of returns to education overall is (13.9%). The returns for education of female are 9.1% which is significantly greater than males that are (2.5%) in rural areas. On the contrast, these results are different from the study of Chen and Hamori (2009) which investigated the economic return to schooling for Chine. The result exhibits slightly greater returns for males are 8.06% than comparable for women that are 7.67.

Test of Endogeneity and Heteroskedasticity Test

As the data was cross section and primary and nor simultaneous equations so there was no chances of endogeneity that's why we use OLS in place of 2SLS and the same was used by mincer however in these cases there are chances of heteroskedasticity ,therefore use the ARCH test below which clearly shows there is no violation of assumption of OLS

Table:6 Heteroskedasticity Test

Heteroskedasticity Test: ARCH			
F-statistic	0.655235	**Prob. F(1,247)**	0.4190
Obs*R-squared	0.658793	**Prob. Chi-Square (1)**	0.4170

The problem in cross-sectional data is heteroskedasticity due to the reason of different cross-sectional units in the data. To eradicate the problem of heteroskedasticity, this study used ARCH test. The probability value 0.41 indicates that there is no heteroskedasticity in the model.

Policy Implications

The policy implications of using a long-linear model to understand the impact of schooling and experience on income are substantial. Policymakers should invest in quality education at all levels to maximize economic benefits and promote lifelong learning to keep the workforce competitive. Emphasis on gender equity in education, targeted support for disadvantaged groups, and career guidance in schools is essential. Complementary labor market policies that facilitate job creation and skill matching, along with data-driven policymaking and continuous evaluation, are crucial for effective implementation. These strategies will help enhance educational outcomes, promote economic growth, and ensure equitable distribution of benefits.

Future Research Direction

Future research on the application of the Mincerian equation to higher secondary school teachers in Abbottabad District can explore several promising directions. Longitudinal studies would be beneficial to track changes in the relationship between education, experience, and income over time, providing insights into the long-term effects of these factors on teachers' careers. Comparative analysis between different districts or regions could identify regional disparities and contributing factors, offering a broader perspective on educational policy effectiveness. Incorporating additional variables such as teacher training, school resources, and socio-economic background could yield a more comprehensive understanding of income determinants. Qualitative research, including interviews and focus groups, would add depth by capturing personal experiences and perceptions not easily quantified. Further gender-specific studies are needed to explore the underlying reasons for income disparities and to design targeted policies promoting gender equity. Analyzing the impact of recent and future

educational policies on economic returns could provide valuable feedback for policymakers. Extending the research to include teachers at primary, middle, and tertiary levels would offer a holistic view of the education-income relationship across the educational spectrum. Additionally, examining differences between teachers in public and private schools could reveal how the sector of employment influences returns to education and experience, informing policies aimed at harmonizing income levels across different types of schools. These directions can build on the findings of this study, offering deeper and more nuanced insights into the relationship between education, experience, and income, ultimately contributing to more effective educational policies and socio-economic development.

Conclusion and Recommendations

This study investigates the role of education and job market experience on the earnings of income targeting higher secondary school teachers in the district Abbottabad. Since the data provided by the education directorate comprising of the monthly staff statements that provides information on completed years of schooling therefore, this study not only estimates the Mincerian earning function also examines the returns to education in education sector. This research will contribute to improve preceding knowledge of positive correlation between educational experience and labor market outcomes in Pakistan particularly to the formal education at schoolteachers' levels in district Abbottabad (KP) Pakistan.

Many patterns emerge when examining how earnings are distributed across the selected sample. The educated people have more dimensions to earn income as compared to less educated individuals. The salaries increase but behind that there are huge expenses for attaining higher education. This investigation deliberates the direct and positive impact in education years as the coefficient value brings a 1% increase in returns for higher secondary school teachers.

The influence of job market experience is positive and significant in relation to monthly income. The addition of an extra year of experience causes 1 percent increase in earnings. The lifecycle of earnings of individual increase at diminishing rate.

While on the other hand, there is a positive relationship found between higher education and income. One-year increase in higher education brings 7 percent increase in income. Higher education has a greater contribution in income. So, findings suggested that the level of higher education is an important factor in the income determination of schoolteachers in our sample. It can significantly influence employees' income.

Our study supports the hypothesis, the fact that higher education, academic years, and job market experience have a significant impact on monthly income. Some of the policy implications in accordance with the findings could be suggested. The new enrollment should be based on higher education. The policy recommendation is to improve and invest in education years. The quality of educational level helps to increase the teacher's income level. The smallest amount of educational qualification for teacher's recruitment should up to MA/ MSc with at least one professional or technical qualification for higher secondary education with corresponding pay packages should be made certain. Respectable wage scales at special levels of education need to be defined and improved. The selection procedures and training system relevant to the educational profession should be upgraded. The new enrollment should be based on higher education. The policy recommendation is to improve and invest in education years. The quality of educational level may help increase the teacher's income level.

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