

Returns to Human Capital in Pakistan: A Gender Disaggregated Analysis

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The impact of human capital variables on the earnings of regular wage employees is explored in this paper. Besides education and experience, literacy index, technical training, and school quality are included in the earning functions estimated for individuals. The credentialist view that education does not improve productivity—that it rather provides positive signals about productivity—is also tested. The results are based on the Pakistan Integrated Household Survey 1995-96 data, which provides information on many aspects of the individual's characteristics missing in other surveys. The results of the study provide ample evidence in favour of human capital as a productivity-enhancing device for both male and female workers. All human capital variables are found to be statistically significant, having positive magnitude. The diploma effect is not very important for Pakistani workers, as only a few diploma dummies are statistically significant.

I. INTRODUCTION

Development economists argue that more resources should be invested for human capital formation because it raises productivity and overall output in the country. Empirical evidence also supports this argument and indicates that returns to investment in human capital are comparable with returns to physical investment [Psacharopoulos (1981)]. The accumulation of human capital bears positive returns for individuals as it enhances their earnings capability [Schultz (1962)]. The present study tests the role of human capital for individual's earnings on Pakistani data and confirms the positive association between human capital and earnings. The human capital earnings function developed by Mincer (1974) and its modified functional forms are used to capture the effect of education and other variables on earnings for male and female workers separately. The results of the study indicate that education and experience are two major sources of human capital formation, which has a direct and positive impact on individual's lifetime earnings [Becker (1962); Mincer (1974)].

As education is the main source of human capital formation, a large number of studies have estimated the returns to education for different countries

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[Psacharopoulos (1980, 1985, 1994); Psacharopoulos and Chu Ng (1992)].¹ Results of these studies find a positive premium of education for workers in all those countries. The few studies done in Pakistan also find a positive association between education and earnings.² In Pakistan, most of the nationally representative household surveys do not contain information on completed years of schooling, which is necessary to estimate the Mincerian earning function.³

In recent years, the government of Pakistan has started a nationwide survey, called the Pakistan Integrated Household Survey (PIHS), to address the imbalances in the social sector. Two rounds of this survey are already completed and the work on the third round is in progress. As an incidental benefit, this survey provides rich information on many education-related variables that were missing in the earlier household surveys. The present study uses the data of the second round of the PIHS for the year 1995-96 to examine the returns to education by using different forms of earning function and thus aims to fill the vacuum that exists in the literature due to the lack of appropriate data on returns to education in Pakistan.

It is important to carry out such a study for the following reasons. First, in order to estimate the effect of human capital variables on earnings, the most recent and nationally representative household survey data are used. This also has an advantage in terms of containing detailed information on some of the variables that were missing in previous surveys. Second, it uses the spline of education years in the earning function to examine the additional earnings associated with extra school years at different levels. Third, this study investigates the role of technical training, school quality, and literacy and numeracy skills in earnings which are important factors of human capital formation. Moreover, earnings premium associated with different diploma years is also explored in the study.

The results of this study indicate that returns to education are not uniform across school years for both male and female workers. We find that earnings increase with each level of education and workers with the highest level of education receive maximum premium. The earnings are found to be lower for female workers for each level of education in comparison to their male counterparts. This is expected due to the widespread discrimination in the labour market and concentration of female

¹Psacharopoulos (1994) provides a comprehensive update of the estimated rates of returns to education at a global scale. He observed high social and private profitability of primary education (18 percent and 9 percent respectively) in all regions of world. The private rates of return at this level were found the highest in Asia (39 percent) as compared to other regions. He also noted a considerable increase in total earnings by an additional year of education in all regions of the world; 13 percent in Sub-Saharan Africa; 10 percent in Asia; 12 percent in Europe/Middle East/North Africa; and 12 percent in Latin America/Caribbean.

²At the national level, only two studies are available in Pakistan that used the Mincerian earnings function approach to examine the returns to education [see Shabbir and Khan (1991) and Shabbir (1994)]. However, both these studies are based on a twenty years old data set.

³Due to the unavailability of data on completed school years, one can neither compute the potential experience nor observe the effect of an additional year of schooling on individual earnings.

workers in low-paying occupations. The results show that technical training, school quality, and literacy and numeracy skills increase earnings by enhancing the productivity of workers. The analysis provides full support to the human capital theory while partial support to the credentialist view.⁴

The paper is organised in the following manner. Section 2 presents the review of literature on returns to education. Section 3 outlines the model for empirical estimation and describes data. Section 4 reports the results. Conclusions and policy implications are presented in the last section.

II. REVIEW OF LITERATURE

2.1. Education and Productivity

Most of the studies on returns to education have used human capital earnings function for estimating the returns to education. The earning function was introduced by Mincer (1974) to capture the effect of an additional year of education on earnings. In the Mincerian earnings function, higher earnings are linked to productivity that increases with the skills generated by schooling and experience. The earnings function provides reasonably accurate estimates on returns to education in the labour market of both developed and developing countries [Welch (1983); Psacharopoulos (1973, 1985)].

In Pakistan, most of the studies which estimated rates of returns to education used the earnings function with dummies for different levels of education mainly due to the data limitations [Haque (1977); Hamdani (1977); Guisinger, Henderson, and Scully (1984); Khan and Irfan (1985); Ahmad, Arshad, and Ahmad (1991); Ashraf and Ashraf (1993, 1993a, 1996)].⁵ All of these studies noted a positive association between the levels of education and earnings, but the estimated returns were lower as compared to other developing countries [Psacharopoulos (1980, 1985, 1994); Psacharopoulos and Ng (1992)].

In 1979, the Federal Bureau of Statistics (FBS) conducted the Population, Labour Force, and Migration (PLM) survey in Pakistan for PIDE. In the PLM survey, unlike the other surveys, education was measured in completed years. By using the PLM data on regular wage employees, Shabbir and Khan (1991) and Shabbir (1994) estimated the Mincerian earning function for Pakistan. These studies found 7 to 8 percent increase in earnings with an additional year of schooling, which was consistent with comparable LDCs.

⁴This conclusion is drawn on the basis of statistical significance of the human capital variables and variables representing the credentist view. We find that all human capital variables are positive and statistically significant whereas only two diploma years are statistically significant.

⁵In Pakistan, the data on education in most of the nationally representative household surveys have been reported in discrete form that denotes the completion of different levels of education, such as 'primary but incomplete middle', 'middle and incomplete matric', and so on.

2.2. Education as a Screening Device

The productivity theory of education (basis for the Mincerian earnings function) has been criticised by the proponents of the screening hypothesis. Arrow (1973) and Spence (1974) argue that education serves as a screening device for potential employers as there is no other mechanism through which information about a worker's productivity is transmitted. They take the completed diploma as a signal of the worker's productivity. The employer believes that a person who stays in school and completes his degree demonstrates consistency in behaviour, and thus he/she can complete any assignment. Because of this ability, the employer higher wages to those who compete their education. In the credentialist view, wages rise faster with extra years of education when the extra year also confers a certificate [Spence (1974) and Riley (1981)].

On empirical grounds, however, there are mixed findings for developed as well as developing countries. The studies by Taubman and Wales (1978) and Gaag and Vijverberg (1989) find positive and significant effects of diploma years on earnings of individuals. In contrast, Psacharopoulos and Layard (1994) find no evidence of the screening or diploma effect. A study by Mohan (1998) for Columbia finds that diploma is important for men but not for women. King (2000) finds that the estimated returns to post-secondary education are less without receiving a diploma than the returns with diploma. In Pakistan, Shabbir (1991) finds significantly high returns in the years when diploma is conferred.

2.3. Impact of Unobservable Characteristics

In the Mincerian earnings function, the impact of unobservable characteristics of workers which were found correlated with education is ignored. For example, innate ability, which is unobservable, positively influences education, and consequently earnings. In the Mincerian earnings function, the returns to education are tangled up with returns to ability. Therefore it overestimates the returns to schooling [Taubman (1975); Chamberlain and Griliches (1977); Olneck (1977); Griliches (1979); Youngert (1994)].

To purge the effect of unobservable characteristics on returns to education, the fixed effects estimation technique was established [Hausman and Taylor (1981)]. In the fixed effects model, the effects of unobservable characteristics are netted out by the transformation of the data by taking deviations from individual means and applying the generalised least squared estimation technique. Although this technique provides unbiased estimates, the technique however requires panel data, which are not available in most of the less developed countries.

The alternative to the fixed effects estimation methodology is the use of proxy variable for the unobservable characteristics of workers in the earnings equations. For the innate ability of workers, which is unobservable and positively linked to education, the scores of the actual test on ability and cognitive skills are used as a proxy [Sabot

(1992); Behrman, Ross, Sabot, and Tropp (1994); Alderman, Behrman, Ross, and Sabot (1996)]. Unfortunately, many of the developing countries, including Pakistan, do not have actual test scores on ability and cognitive skills at the national level.

2.4. Sample Selectivity Bias

Another major development took place in the literature when researchers noticed that restriction of sample to a particular group also biases the results estimated by the ordinary least squares method. The sample selection bias was observed when the sample of wage-earners was selected for the analysis of returns to education and the information on non-wage earners was ignored. The estimation of restricted sample by ordinary least squares produced biased results. This outcome was the result of the inclusion of workers possessing characteristics more attractive to employers.

Heckman (1979) suggested a two-step procedure to tackle the sample selectivity problem. In the first step of this procedure, the inverse of Mill's ratio, a new regressor, is constructed by estimating a probit model for the probability that an individual is earning. In the second step, earnings are estimated by ordinary least squares using the inverse of Mill's ratio. This procedure requires the entire sample containing both wage and non-wage earners in the estimation process. The estimates obtained by this method are found unbiased. The Heckman procedure is widely used for the correction of sample selectivity problem. In Pakistan, sample selectivity problem is not significantly affecting the estimated values for male workers [Nasir (1999); Ashraf and Ashraf (1998)]. The estimates for female workers, however, need adjustment for sample selectivity bias.

2.5. Spline in the Years of Education

In the Mincerian Earnings function, it is assumed that returns to education are uniform across different levels of education. The literature from different parts of the world, however, reveals that different school years impart different skills to the workers and bring different returns [Gaag and Vijverberg (1989); Khandker (1990); Schultz and Mwabu (1998)]. Therefore, it is misleading to consider uniform rates of return for all years of education. Schultz and Mwabu (1998) used a three-level spline in years of education for the estimation of returns to education for different school levels. In this approach, slope of the earnings function changes at different educational levels if there are significant differences in returns to education for those levels.

2.6. Rationale of the Study

The review of literature indicates that there is very little work done on the estimation of returns to education in Pakistan. Moreover, the last study, which estimated the Mincerian earnings function, used the PLM 1979 data, which is more than twenty years old. Since then, economy of Pakistan has gone through many changes, especially after the inception of the Structural Adjustment and

Stabilisation Programme sponsored by the IMF and the World Bank in the late 1980s. The fiscal and monetary constraints imposed by the Structural Adjustment and Stabilisation Programmes have severely restricted the ability of the government to influence the economy. This has changed the human resource development of the country. The technological developments have also altered the human capital requirements of the economy. There was a need to address these issues and see the impact of these changes on education, which sets the future course of development of the country.

In the present study, an attempt is made to estimate the Mincerian earnings function to update the work on returns to education and capture the effect of changes on the returns to education in Pakistan. We extend the analysis by utilising the spline function in the years of education to see how different school years affect the wage growth. This is important because the Mincerian earnings function is based on the unrealistic assumption of uniform rates of return for all years of schooling. The credentialist view, which claims that earnings increase more rapidly in the years when a diploma is awarded, has also been tested. The model is further extended by introducing some important variables, such as technical education and school quality, to see their relevance in the labour market.⁶

III. THEORETICAL MODEL, DATA AND ESTIMATION METHODOLOGY

We start with the human capital model developed by Becker (1964) and Mincer (1974) where natural logarithm of monthly earnings are the function of completed school years, labour market experience, and other socio-economic characteristics. In mathematical form, the equation can be written as:

$$\ln W_i = \beta_0 + \beta_1 EDU_i + \beta_2 EXP_i + \beta_3 (EXP_i)^2 + \beta_4 Z_i + U_i \dots \dots \quad (1)$$

where $\ln W_i$ stands for natural logarithm of monthly earnings, EDU_i represents completed years of schooling, and EXP_i is the labour market experience of i th individual. The square term of the experience is used to capture the non-linearity of the model due to experience. The coefficient β_1 in Equation 1 represents the rate of return to education. A positive value of the coefficient of experience, β_2 and negative value of experience square, β_3 , reflects the concavity of the earning function with respect to experience. The coefficient of vector Z_i captures the effect of socio-economic characteristics on earnings. An error term U_i is added in the model which is assumed to be normally and identically distributed with zero mean and a positive variance.

⁶It would have been useful to test for the effect of ability on earnings, but due to the non-availability of panel data or actual test scores on cognitive abilities, we could not separate the effects of ability from education and test its effect on earnings.

In order to examine the effect of different years of education on earnings, Gaag and Vijverberg (1989); Khandker (1990); and Schultz and Mwabu (1998) used the spline of school years based on the education systems of the countries under study. Following this approach, we use the six-level spline of school years based on the education system of Pakistan. In Pakistan, Primary education consists of 5, Middle 8, and Matric 10 years of schooling. After the Matriculation Certificate, students have the choice to join either a technical institution for three years of a diploma programme or continue the formal education for two more years to obtain the Higher Secondary School Certificate. The Intermediate Certificate is the gateway to professional degree programmes of four to five years and general bachelor's degree programme of two years.⁷ Those who choose general education can pursue the Master's degree in a university for two more years. It takes 16 to 17 years, in total, to complete education at the Master's level in Pakistan. After obtaining the Master's degree, a student can proceed to the MPhil or the PhD degree.

In mathematical form, the system of education can be summarised as:

$$\ln W_i = \beta_0 + \beta_1 Yrs Prim_i + \beta_2 Yrs Mid_i + \beta_3 Yrs Mat_i + \beta_4 Yrs Inter_i + \beta_5 Yrs BA_i + \beta_6 Yrs Prof_i + \beta_7 EXP_i + \beta_8 (EXP_i)^2 + \beta_9 Z_i + U_i \quad \dots \quad \dots \quad \dots \quad (2)$$

In Equation 2, *YrsPrim*, *YrsMid*, *YrsMat*, *YrsInter*, *YrsBA* and *YrsProf* represent splines corresponding to the Primary, Middle, Matric, Intermediate, Bachelors, and professional degree education. The coefficients associated with these variables measures the premium of additional year of education at the respective level.

The model in Equation 2 is extended by including other human capital variables such as literacy and numeracy skills, quality of schooling, and technical training.⁸ The effect of literacy and numeracy skills is estimated by Gagg and Vijverberg (1989) for workers in Côte d'Ivoire who did not attend the formal school but learned literacy and numeracy skills. The study shows that workers having literacy and numeracy skills earned more than illiterates having no such skills. Similarly, private schools are found to be effective in providing quality education and raising the skill level of workers [Sabot (1992); Behrman, Ross, Sabot, and Tropp (1994); Alderman, Behrman, Ross, and Sabot (1996); Alderman, Behrman, Ross, and Sabot (1996a); Behrman, Khan, Ross, and Sabot (1997); Nasir (1999)]. Table 1 shows that workers graduated from private schools earn more than those who graduated from public schools. This is in line with our expectations because private schools not only enhance the cognitive skills but also

⁷Engineering degree requires four years of schooling while medical and law degrees require five years after completing the FA/FSc.

⁸See Summers and Wolf (1977); Rizzuto and Wachtel (1980); Behrman and Birdsall (1983); Boissiere, Knight, and Sabot (1985); Knight and Sabot (1990); Behrman, Ross, Sabot, and Tropp (1994); Behrman, Khan, Ross, and Sabot (1997).

Table 1

Average Monthly Earnings of Workers Who Attended Public and Private Schools

Education/School	Public School	Private School
Primary	2078.98	2300.00
Middle	2104.96	2395.00
Matric	3461.40	3792.58
Intermediate	4365.84	5626.40
Degree	4677.62	6220.27
Professional Degree	5071.26	7372.95
Total	4054.75	6596.78

Source: PIHS 1995-96.

adopt a market-oriented approach, which helps workers to receive higher earnings.⁹

The effect of post-school training on earnings has been found positive and substantial in many developing countries including Pakistan [Jimenez and Kugler (1987); Gaag and Vijverberg (1989); Khandker (1990); Nasir (1999)]. Training is an integral part of human capital formation, therefore workers receive high premium if they receive any training. We expect a positive link between earnings and training.

To estimate the impact of education and the above-mentioned variables on earnings, an appropriate data set is a prerequisite. Most of the data sets available in Pakistan do not provide the information required for this study. The recently conducted nationally representative Pakistan Integrated Household Survey (PIHS) 1995-96, however, contains information on the variables included in this study. The PIHS is a first of the series of surveys conducted to assess the performance of the Social Action Programme (SAP) of the Government of Pakistan for the uplift of the social sectors. The task of this collaborative nationwide data collection effort was undertaken by the Federal Bureau of Statistics (FBS). So far, two rounds (i.e., 1990-91 and 1995-96) have been completed and the work on the third round is in progress. All of these rounds are different from each other as only 33 percent of the previous sample is covered in the subsequent rounds. The first round of PIHS was conducted in 1991 and covered around 5000 households, whereas the second round (used for

⁹These schools, however, charge higher fees. "Estimates of average annual expenditure per pupil in both government and private schools indicates that the total cost of Primary level in rural areas is Rs 437 (Rs 355 for government schools and Rs 1252 for private schools), as compared to Rs 2038 in urban areas (Rs 1315 for government and Rs 3478 for private schools). This means that the cost of Primary schooling is almost three times that of public schools in urban areas and nearly four times in rural areas. The differences in the cost of schooling also reflect the degree of quality differentials in public and private schools, and between urban and rural schools. A relatively better provision of school facilities and quality of education in private schools is causing a continuous rise in school enrolment in urban areas" [Mehmood (1999)].

this study) covers 12,622 households and provides information on more than 84,000 individuals.

The PIHS provides information on many dimensions of the labour force in Pakistan. The survey contains information on years of schooling as well as school-starting age.¹⁰ This information is particularly important for our study to calculate the potential experience of a worker. The indicator for experience used by Mincer (1974) is a good proxy for U.S. workers as they start school at the uniform age of six years.¹¹ However, this assumption does not hold in Pakistan, as in this country there is no uniform age to start school especially in rural areas, where school-starting age ranges from 7 to 10 years.¹² In urban areas, some children attend pre-nursery, nursery, and kindergarten classes at an early age but enrol in class one at age 6. The information on age of starting school enables us to construct a better proxy for Mincer type potential experience.¹³

Because the PIHS contains information on the type of school attended by the worker, a dummy variable is included in the model to capture the effect of school quality. The dummy variable takes the value '1' if the individual is a graduate of private schools and '0' otherwise. To capture the effect of literacy and numeracy skills, an index "RWA" is constructed that separates illiterates from those who have reading, writing, and simple arithmetic skills. This index takes the value 'zero' if the individual does not possess any skill; '1' if the individual has only one skill; '2' if individual has two skills; and '3' if the individual has all three skills. The information on technical training is available in completed months. This is converted into years to include in the model. Inclusion of training in the model as a continuous variable allows us to estimate the effect of additional year of training on workers' earnings. Because the effect of short-term training is different from the long-term, the variable is divided into three levels to separate the effect of short-run training from that of the long-term. The three levels include training of less than one year, one and more years but less than three years, and three years and above.

The existence of vast gender gap in human capital accumulation is evidenced by various studies in Pakistan.¹⁴ Table 2 shows the enrolment in educational institutions for males and females during the 1947–96 period in Pakistan. One can observe the lower enrolment level of females as compared to males over the years at every stage of education. The PIHS data also reports vast gender disparities in

¹⁰This is the only nationwide data set that provides this particular information. Similarly no other survey contains information on public and private school attendance and year of starting school.

¹¹Mincer defined experience as (Age-education-6).

¹²The issue of age of starting school has been highlighted by Ashraf and Ashraf (1993) and because of the non-availability of this information, they use age as proxy for experience.

¹³Mincer defined the experience as age-schools years-6. We augmented this by using age of starting school for those who started school after age six.

¹⁴Sabot (1992); Alderman, Behrman, Ross, and Sabot (1996a); Sawada (1997); Shabbir (1993); Ashraf and Ashraf (1993, 1993a, 1996).

Table 2

Enrolment in Educational Institutions: Pakistan 1947-96

School Type	Sex	1947-48	1959-60	1969-70	1979-80	1989-90	1995-96
Primary	M	6864	14641	30120	39449	80556	82949
	F	1549	3260	11170	17771	29966	32795
Middle	M	2037	1693	2700	3826	5003	6625
	F	153	218	860	1407	3055	3961
High	M	344	866	1475	2437	5289	7352
	F	64	203	520	924	1895	2305
Arts and Science	M	35	94	205	311	365	451
	F	5	32	85	119	210	256
Professional	M	0	35	54	91	91	148
	F	0	05	05	08	08	09

Source: *Economic Survey* (Various Issues).

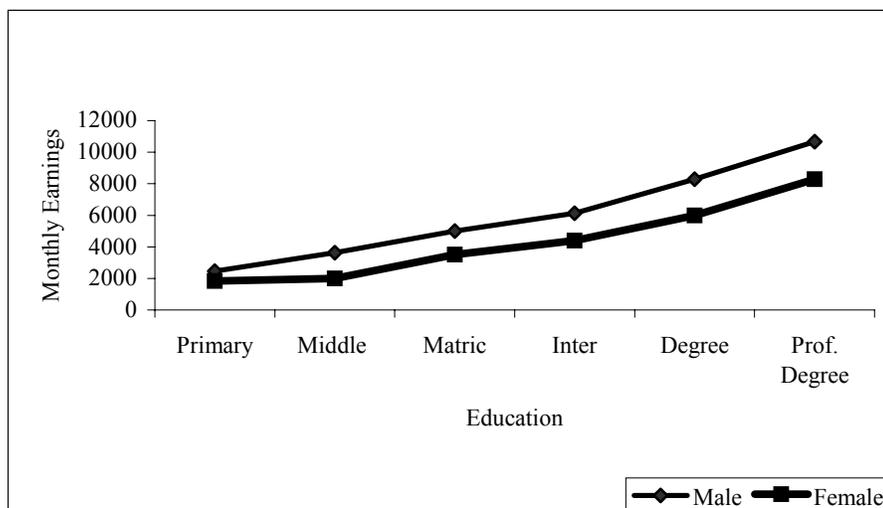
literacy and enrolment rates. The literacy rate among females is half that of males at Pakistan level. This difference increases threefold for rural areas. For the higher levels of education, this difference also shows an increasing trend. Similarly, a vast gender gap is observed in returns to education favouring males disproportionately [Ashraf and Ashraf (1993, 1993a, 1996); Nasir (1999)]. The gender-specific average monthly earnings at different educational levels drawn from the PIHS 1995-96 are presented in Table 3 and graphed in Figure 1. We can observe the gap in earnings for male and female workers for different educational categories. This suggests the need for gender-based analysis of returns to education. For that purpose, a dummy variable is introduced in the model that takes the value '1' for males and '0' otherwise. The Chow test will be carried out to see the structural difference in returns to education for male and female workers. In case of structural difference, a separate analysis will be carried out for males and females.

Table 3

Average Earnings of Workers by Education and Sex

Education	Male	Female	Both Sexes
Primary	2450.77	1828.92	2146.03
Middle	3623.53	2001.86	2752.11
Matric	4998.01	3515.36	3798.50
Intermediate	6134.94	4402.28	4062.93
Degree	8287.66	5987.93	6829.44
Professional Degree	10675.15	8286.45	9325.26
Total	3678.65	2975.25	3153.06

Source: PIHS 1995-96.



Source: PIHS 1995-96.

Fig. 1. Monthly Earnings by Education and Sex.

The regional imbalances in the provision of limited available social services are more pronounced in Pakistan. Rural areas are not only underdeveloped in terms of physical infrastructure but are also neglected in acquiring basic amenities. Haq (1997) calculated the disaggregated human development index for Pakistan and its provinces. He notes that nearly 56 percent of population is deprived of basic amenities of life in Pakistan; 58 percent in rural areas and 48 percent in urban areas. According to the PIHS 1995-96, the literacy rate in urban areas is 57 percent and in rural areas it is 31 percent. The gross enrolment rate is noted as 92 percent in urban areas and 68 percent in rural areas. Because of these differences, low returns to education are observed in rural areas [Shabbir (1993, 1994); Nasir (1999)]. To capture the effect of regional differences, a dummy variable is used that takes the value '1' if the individual is an urban resident and zero otherwise.

The four provinces of Pakistan exhibit different characteristics in terms of economic as well as social and cultural values. The provincial difference is clear in the following Table 4, where average earnings for workers at different levels of education are presented. The earnings are difference at each level of education in different provinces. This reflects not only the differences in market opportunities but also indicates uneven expansion of social services across provinces [Khan and Irfan (1985); Shabbir and Khan (1991); Shabbir (1993); Shabbir (1994); Haq (1997)]. The effect of these differences is captured through the use of dummy variables for each province in the earning function; Sindh is in the excluded category. We also test

Table 4

Average Earnings of Workers by Education in Different Provinces

Education/Province	Punjab	Sindh	NWFP	Balochistan
Primary	2548.22	1631.31	2057.93	2293.53
Middle	2603.29	1708.61	2043.65	2314.15
Matric	2611.27	2818.95	2145.69	3380.36
Intermediate	2770.85	3048.40	3502.47	3811.91
Degree	3867.31	4052.29	3716.95	4274.75
Professional Degree	4195.85	4578.18	4406.95	4746.59
Total	3715.32	4252.29	3915.08	4486.63

for the diploma effect by adding dummies for the diploma years in the model. This approach will allow us to capture supplemental returns—to complete each of the critical categories of education.

For the purpose of this analysis, we restrict our sample to regular wage and salaried employees. Our sample contains 4828 individuals who reported information on educational attainment, earnings, and other related variables used in the analysis. Among them, 4375 are males and 453 are females. Table 5 presents the definition and descriptive statistics of the important variables.

According to the statistics presented in Table 5, average age of the individuals included in the sample is 34 years and the majority (78 percent) has received formal education. The average schooling received by workers in the sample is 9.88 years. It is noted that 15.4 percent, 11 percent, 21 percent, 10.5 percent, 11 percent, and 8.7 percent have completed Primary, Middle, Matric, Intermediate, Degree and Professional Degree education, respectively. Among those who received formal education, the majority has graduated from the public schools. Most of those who could not attend school or received less than six years of education acquired some literacy skills.¹⁵

It is also noted that a typical worker in the sample has 16.14 years of labour market experience and earns Rs 3163 per month. Those who received technical training constitute 22 percent of the sample. The average time spent on training by the workers is 1.45 years. Married couples constitute 83 percent of the sample. Those who live in urban areas comprise 60 percent of the sample. Furthermore, the majority of wage-earners belongs to Punjab, followed by Sindh and Balochistan.

¹⁵The data show that 37 percent have reading skills whereas 31 percent and 72 percent have writing and simple arithmetic skills.

Table 5

Mean, Standard Deviation and Brief Definitions of Important Variables

Variables	Mean	SD	Definitions of Variables
W	3153.06	3340.27	Individual's monthly earnings in rupees consist of wages and salaries (both cash and in kind).
AGE	34.07	12.36	Age of an individual in completed years.
MSP	0.83	0.35	Dichotomous variable equal to 1 if individual is married, 0 otherwise.
EDU	9.88	3.95	Completed years of schooling.
EXP	16.14	11.80	Total Years of labour market experience calculated as (age-school years-6) we used age of starting school in case the individual started school after six years of age.
RWA	2.37	1.07	Categorical variables, contains 4 categories of literacy and numeracy.
MALE	0.91	0.29	Dichotomous variable equal to 1 if individual is male, 0 otherwise.
URBAN	0.60	0.49	Dichotomous variable equal to 1 if individual belongs to urban area.
PRIVATE	0.04	0.19	Dichotomous variable equal to 1 if individual is a graduate of private school.
TRAINING	1.45	1.26	Completed years of technical training.
PUNJAB	0.38	0.49	Dichotomous variable equal to 1 if individual belongs to Punjab.
SINDH	0.31	0.46	Dichotomous variable equal to 1 if individual belongs to Sindh.
NWFP	0.15	0.36	Dichotomous variable equal to 1 if individual belongs to NWFP.
BALUCH	0.16	0.36	Dichotomous variable equal to 1 if individual belongs to Balochistan.

IV. EMPIRICAL RESULTS

The estimated results of Equation 1 for complete sample are reported in Table 6. The highly significant Chow test suggests that single equation is inadequate in estimating the returns to education due to structural difference in gender outcomes.¹⁶ Based on this finding, separate equations are estimated for male and female workers. The F-statistics and adjusted R^2 indicate that model specification is good and the

¹⁶The coefficient of variable male is large in magnitude and statistically significant. This shows that females are not treated equally in the labour market. To test the structural differences in the earnings of male and female workers, we used the Chow Test.

variables included in the model are appropriate. The relatively higher value of adjusted R^2 for the female sample is the result of small and homogenous sample of those select women who choose to enter female-dominated occupations. The highly significant coefficients of school years and experience endorse the applicability of human capital model for both male and female workers in Pakistan.¹⁷

4.1. Education and Experience

The results indicate that an additional year of schooling raises the earnings by 8.2 percent of male workers and 7.04 percent for female workers (see Table 6). The earnings for male workers are consistent with prior studies on Pakistani data, as well as with comparable Less Developed Countries (LDCs).^{18, 19} The estimated returns for females are relatively low in comparison to other studies of the country [Ashraf and Ashraf (2002, 1996)]. This is due to a variety of reasons. In many situations, female work is undervalued and females are discriminated against in the present socio-economic milieu. In their study, Ashraf and Ashraf (1996) attributed the low earnings of female workers to the discrimination against them in the Pakistani labour market. The low earnings of female workers are also the result of their concentration in occupations which are structurally low-paying. The PIHS and other data sets show that the majority of female workers is associated with low-paying industries such as social services, welfare, and community-based services. The jobs in these industries provide flexibility in timings, require low mobility, and pay comparatively low wages. Their presence in these industries could be the result of discrimination against them or of their own preference for such jobs. In any case, these women are not treated fairly in the labour market.

The coefficient of experience shows substantial increase in wages with each additional year spent in the labour market for both male and female workers. However, earnings increase more rapidly for male workers as compared to females. The concavity of experience-income profile is evident from the negative and significant coefficient of experience squared. The results reveal that five years of experience earns 28 percent higher wages to male workers and 21 percent to female workers as compared to their counterparts with no experience. Male workers reach the peak of their earnings with 34 years of experience whereas female workers attain the peak with 39 years of experience. A relatively late peak attained by female workers as compared to male workers is consistent with prior studies [Ashraf and Ashraf (1993); Kozel and Alderman (1990); Nasir (1998)]. As noted in other

¹⁷Some of the interaction terms were tested in the model but they were statistically insignificant.

¹⁸The estimated coefficients of school years by Shabbir and Khan (1991); Shabbir (1991); Shabbir (1993); Shabbir (1994) are found to be in the range of 6 percent to 9.7 percent.

¹⁹The returns to education are calculated by taking the anti-log of 0.092 (estimated coefficient of completed school years) and subtracting from 1. To convert into percentage, multiply the value by 100. For details, please see Gujrati (1988), p. 149.

Table 6

Mincerian Earning Functions by Sex

Variable	Complete Sample		Male Workers		Female Workers	
	Coefficient	t-ratios	Coefficient	t-ratios	Coefficient	t-ratios
Constant	6.051***	119.77	5.701***	36.83	6.608***	32.50
EDU	0.079***	37.69	0.096***	15.98	0.068***	39.20
EXP	0.047***	17.05	0.059***	6.61	0.044***	19.96
EXPSQ	-0.001***	-13.73	-0.00087***	-5.52	-0.00056***	-15.94
URBAN	0.186***	8.66	0.199***	7.31	0.165***	9.85
MSP	0.158***	5.68	0.220***	6.28	0.114***	5.07
BALOCH	0.177***	5.63	0.185***	2.94	0.128***	5.29
NWFP	-0.160***	-5.01	-0.181***	-4.73	-0.121***	-4.74
PUNJAB	-0.204***	-8.41	-0.243***	-3.47	-0.193***	-9.98
MALE	0.243***	18.34	-	-	-	-
Adj R ²	0.342		0.402		0.466	
F-statistics	59.63		62.38		40.26	
Sample	4828		4375		453	

Source: PIHS 1995-96.

***Significant at 99 percent level.

studies, females have the tendency to withdraw and re-enter in the labour market due to family reasons [Mincer (1974)]. They may not be able to work as regularly as male workers do, and therefore accumulate less human capital, receive low earnings, and reach the peak later than do male workers. Our results differ from other studies which report relatively higher returns for experience for both male and female workers.²⁰

The positive and significant coefficients of URBAN strengthens the *a priori* expectations that both male and female workers earn more in urban areas than workers who live in rural area. According to the estimated coefficient, male workers earn 22 percent while female workers earn 17.9 percent more in urban areas. These finding are consistent with earlier studies [Nasir (1998); Ashraf and Ashraf (1993); Khan and Irfan (1985)]. The high cost of living and better job opportunities in cities are some of the reasons for high wages in urban areas as compared to rural areas.

²⁰The difference in the returns to experience could be due to the approach adopted by these studies. Most of the studies used age as a proxy for experience [see for example, Khan and Irfan (1985); Ashraf and Ashraf (1993); Nasir (1999)]. Shabbir (1991) used the Mincerian approach to calculate experience. The present study uses actual age of starting school and actual years of education. This information enables us to calculate total years of labour market experience. This approach is also not the perfect alternative to actual experience, as we do not have information about the starting-time of the first job. But when compared with other approaches, it is more precise in measuring experience.

Similar to other studies, high premium is found for married workers (both male and female) in the Pakistani labour market [Nakosteen and Zimmer (1987); Korenman and Newmark (1991); Keely (1977)]. This is the result of their motivation and responsible behaviour in executing their duties as compared to single workers. The marriage premium is relatively higher for males due to their status as breadwinner in the family. Furthermore, significant inter-provincial differences in individual earnings can be observed in the estimated model. These differences are the result of difference in job opportunities in different provinces. The earnings are high where the job market has higher demand, and low where the opportunities are less and supply of labour is high.

Many studies indicate substantial differences in earnings across school levels in different countries [Gaag and Vijverberg (1989); Schultz and Mwabu (1998)].²¹ In order to examine the returns to education across different school years, we estimate the earning function with spline in education years (Equation 2).²² The results presented in Table 7 show a positive and significant impact of school years at each educational level on earnings for males as well as females.²³ For example, an increase of one year in education at middle level increases the earnings by 9.8 percent for male workers, but 2.9 percent for female workers. The earnings increase at much faster rate every year for ten and more years of education for both sexes. For example, the results show that returns to each year of education for male workers at Matric level are three times; six times for degree education and approximately seven times higher for professional education (*Yrs-Prof*) than those of Middle school years (*Yrs-Mid*). Similarly, for females returns are four times higher for Matric, eight times for Inter, thirteen times for Bachelor's Degree and twenty times for Professional Degree holders as compared to the returns for each year spent in middle schools.

No statistically significant difference is observed for female workers at Primary level as compared to their illiterate counterparts. However, male workers earn 2.4 percent higher wages at Primary level as compared to illiterates. These estimates are relatively high as compared to those of other studies, [Hamadani (1975); Haque (1977); Khan and Irfan (1985); Shabbir (1991)]. The main reasons for this discrepancy are the differences in the estimation method and the use of the latest nationally representative data.²⁴ As advancements in technology require a high content of human capital, therefore employers pay more to attract educated workers. Those with a Professional Degree receive the highest returns, followed by

²¹For example, Van der Gaag and Vijverberg (1989) noted that an increase of one year in elementary, high, and university education causes an increase of 12 percent, 20 percent, and 22 percent respectively in earnings in Côte d'Ivoire.

²²The results of similar specifications used by Schultz and Mwabu (1998) exhibit similar results for workers in Pakistan. These results are reported in the Appendix.

²³The estimated coefficient for female workers is statistically insignificant for primary years of education.

²⁴Most of the studies cited here are based on the city-specific data or twenty years old data.

Table 7

Earning Function with Levels of Education by Sex

Variable	Male Workers		Female Workers	
	Coefficient	<i>t</i> -ratios	Coefficient	<i>t</i> -ratios
Constant	6.871***	93.13	6.541***	91.36
EXP	0.045***	16.36	0.045***	23.84
EXP ²	-0.001***	-13.82	-0.001***	-16.88
URBAN	0.200***	9.39	0.192***	7.98
MSP	0.183***	6.62	0.181***	6.60
BALOCH	0.153***	4.85	0.151***	3.32
NWFP	-0.150***	-4.70	-0.132***	-3.91
PUNJAB	-0.176***	-7.23	-0.152***	-7.63
Yrs-Prim	0.024***	3.12	0.001	1.09
Yrs-Mid	0.094***	6.37	0.029***	6.12
Yrs-Mat	0.266***	16.25	0.127***	15.02
Yrs-Inter	0.350***	17.48	0.249***	17.36
Yrs-BA	0.542***	27.12	0.392***	25.65
Yrs-Prof	0.615***	31.72	0.609***	30.89
Adj R ²	0.342		0.429	
F-statistics	69.36		53.25	

Source: PIHS 1995-96.

***Significant at 99 percent level.

Bachelor's Degree holders. Those who have no education or Primary level of education are mostly employed in the informal sector, which uses old technology and does not require high content of human capital. Therefore, the returns for five and less years of education are lower for males and zero for females. To further investigate the role of education in earnings, we separate illiterates from those who reported literacy and numeracy skills.

4.2. Literacy and Numeracy Skills

Workers who did not attend formal schools are considered as illiterates in the analysis. These workers are separated from those who possess the literacy and numeracy skills, and we re-estimated Equation 2 by including the new variable *RWA* to capture the effect of reading, writing, and arithmetic skills on earnings.²⁵ According to our expectations, the coefficient of *RWA* for male

²⁵There are 48 wage-earners in our sample who have an education less than Primary but do not have any of these skills. Whereas we found 76 wage-earners who do not have any formal education but have at least one of these skills.

workers is not only large (0.032) in magnitude but also statistically significant at 99 percent level. This indicates that the individuals with all three skills earn 10 percent more than those who have no skill. On the other hand, the coefficient of *Yrs-Prim* dropped to 0.006 and became insignificant.²⁶ The estimated coefficient of *RWA* for females is statistically significant at 95 percent confidence level but small (.01) in magnitude, which suggest that having all three skills raises the earnings by 3 percent. The coefficient of primary level remains insignificant for females.

These findings suggest that the literacy and numeracy skills are more valued in the Pakistani labour market than years of schooling at Primary level without acquiring these skills. Employers are willing to pay higher wages to workers having literacy and numeracy skills even if they do not have any formal schooling. Moreover, those who claim school attendance but could not use their literacy and numeracy skills earn no premium for their education. Because the majority of the low-educated and illiterates belongs to the informal sector, these findings are not surprising. Our results are consistent with other studies which explored the role of literacy and numeracy skills in earnings [Gaag and Vijverberg (1989)].

4.3. Technical Training

The impact of technical training on earnings is examined in two ways. First, the model is estimated by including the years of apprenticeship as a continuous variable. Next, the training years are divided into three levels spline, i.e., less than one year, greater and equal to one year and less than three years, and three years and above. The impact of technical training is explored only for male workers because very few females in the sample received technical training. The results reported in Table 8 indicate that earnings increase by 3.3 percent with every additional year of training. All other estimates remain unchanged. In the next step we estimated the equation with three levels spline in years of training. The results reported in Table 9 indicate that there is no significant impact of training on earnings if training is less than 3 years. However, three and more years of training yields significant premium to individuals (4 percent). These results support the human capital view where training enhances the productivity of workers and in return they receive higher earnings.²⁷ The results further show that the major impact on earnings stems from the three or more years of training. This points out the importance of long-term training programmes, which are designed to impart specialised skills to workers.

²⁶This result is consistent with Van der Gaag and Vijverberg (1989).

²⁷See, for example, Jimenez and Kugler (1987); King (1990); Khundker (1990); Nasir (1990).

Table 8

Earning Function with Levels of Education by Sex

Variable	Male Workers		Female Workers	
	Coefficient	t-ratios	Coefficient	t-ratios
Constant	6.634***	93.07	6.538***	90.98
EXP	0.046***	16.38	0.043***	22.38
EXP ²	-0.001***	-13.79	-0.001***	-15.31
URBAN	0.198***	9.36	0.191***	7.93
MSP	0.184***	6.67	0.183***	6.67
BALOCH	0.152***	4.86	0.149***	3.32
NWFP	-0.149***	-4.70	-0.131***	-3.91
PUNJAB	-0.176***	-7.20	-0.153***	-7.59
RWA	0.032***	3.52	0.010**	2.16
Yrs-Prim	0.006	1.29	0.0009	0.96
Yrs-Mid	0.092***	6.33	0.026***	6.12
Yrs-Mat	0.263***	16.21	0.123***	15.02
Yrs-Inter	0.350***	16.59	0.245***	17.36
Yrs-BA	0.544***	28.91	0.390***	25.65
Yrs-Prof	0.611***	30.65	0.598***	30.89
Adj R ²		0.346		0.452
F-statistics		71.91		55.37

Source: PIHS 1995-96.

***Significant at 99 percent level.

**Significant at 95 percent level.

Table 9

Earning Functions with Education and Training

Variable	Male Workers		Female Workers	
	Coefficient	t-ratios	Coefficient	t-ratios
Constant	6.610***	93.01	6.597***	92.78
EXP	0.043***	16.32	0.041***	16.24
EXP ²	-0.001***	-13.79	-0.001***	-13.75
URBAN	0.197***	9.35	0.198***	9.41
MSP	0.182***	6.63	0.181***	6.56
BALOCH	0.154***	4.83	0.154***	4.83
NWFP	-0.149***	-4.71	-0.147***	-4.73
PUNJAB	-0.177***	-7.25	-0.178***	-7.31
RWA	0.031***	3.50	0.030***	3.54
Yrs-Prim	0.006	1.27	0.006	1.32
Yrs-Mid	0.091***	6.38	0.090***	6.34
Yrs-Mat	0.264***	16.21	0.263***	16.20
Yrs-Inter	0.349***	17.48	0.348***	17.34
Yrs-BA	0.540***	28.21	0.542***	28.30
Yrs-Prof	0.617***	31.71	0.615***	31.67
TRAIN	0.033***	3.69	-	-
TRAINL1	-	-	0.001	0.84
TRAINL3	-	-	0.014	1.24
TRAIN3+	-	-	0.041***	4.19
Adj R ²		0.353		0.454
F-statistics		74.64		57.52

Source: PIHS 1995-96.

***Significant at 99 percent level.

4.4. Private vs. Public Schools

Private schooling is used as a proxy for the quality of education in the model to see its impact on earnings of individuals. The results presented in Table 10 show that both male and female workers receive substantial gains if they received their education from private schools. A male graduate of a private school earns 26 percent higher income as compared to the graduate of a public school. The benefits are higher for female workers who receive 31 percent more earnings as compared to their counterparts who graduated from public schools. These results imply that the quality of education provided by private schools and the skills generated by these schools strongly influence the productivity of workers which translate into higher earnings for individuals. The rewards are higher for females as they receive comparatively higher premium. This suggests that private schools act as an instrument to provide them an opportunity to be treated at the same level as males are treated in the labour market. This also reduces the extent of discrimination against them.

Table 10

Earning Functions: Training and School Quality

Variable	Male Workers		Female Workers	
	Coefficient	<i>t</i> -ratios	Coefficient	<i>t</i> -ratios
Constant	6.632***	92.79	6.539***	90.93
EXP	0.042***	16.23	0.042***	22.21
EXP ²	-0.001***	-13.75	-0.001***	-15.10
URBAN	0.199***	9.41	0.192***	6.59
MSP	0.180***	6.57	0.182***	6.07
BALOCH	0.151***	4.82	0.148***	3.27
NWFP	-0.147***	-4.72	-0.129***	-3.84
PUNJAB	-0.177***	-7.33	-0.155***	-7.58
RWA	0.031***	3.54	0.010**	2.25
Yrs-Prim	0.006***	1.32	0.0007	0.0.81
Yrs-Mid	0.091***	6.34	0.023***	6.09
Yrs-Mat	0.260***	16.19	0.121***	15.32
Yrs-Inter	0.348***	17.33	0.244***	17.29
Yrs-BA	0.543***	28.37	0.394***	25.61
Yrs-Prof	0.613***	31.65	0.610***	30.90
PRIVATE	0.232***	6.68	0.271***	8.58
TRAINL1	0.001	0.83	-	-
TRAINL3	0.013	1.25	-	-
TRAIN3+	0.042***	4.20	-	-
Adj R ²		0.342		0.454
F-statistics		76.32		60.24

***Significant at 99 percent level.

**Significant at 95 percent level.

4.5. Diploma Effect

To test for the screening hypothesis, dummies for Primary, Middle, Matric, Inter, Degree, and Professional Degree are added along with education and the results are presented in Table 11.

The results show that the magnitude of coefficient of education drastically reduces with the addition of dummies for diploma years. Moreover, some of the diploma years turned out to be statistically significant for both male and female workers. This suggests that workers do receive benefits of the diploma in the Pakistani labour market. The results show that both male and female workers receive benefits of the Matric certificate and the BA degree, while females also get benefits of Professional Degree. This is an indication that the diploma effect is more pronounced for female workers as compared to males. It is also observed for female

Table 11

Earning Functions with and without Diploma Dummies

Variable	Male Workers		Female Workers	
	Coefficient	<i>t</i> -ratios	Coefficient	<i>t</i> -ratios
Constant	5.658***	38.41	3.524***	26.25
EDU	0.032***	1.96	0.013***	7.230
EXP	0.058***	6.56	0.047***	20.51
EXPSQ	-0.00083***	-5.83	-0.00058***	-14.65
URBAN	0.195***	6.84	0.171***	10.73
MSP	0.214***	6.49	0.113***	5.14
BALOCH	0.172***	2.87	0.125***	5.23
NWFP	-0.188***	-3.29	-0.119***	-4.34
PUNJAB	-0.247***	-4.03	-0.182***	-8.58
Dip-Prim	0.009	0.23	0.011	0.25
Dip-Mid	0.015	0.94	0.021	1.21
Dip-Mat	0.198***	2.93	0.093***	8.73
Dip-Inter	0.035	1.09	0.054	0.97
Dip-BA	0.286***	5.95	0.148***	7.99
Dip-Prof	0.023	0.38	0.125**	1.86
Adj R ²	0.402		0.466	
F-statistics	62.38		40.26	
Sample	4375		453	

***Significant at 99 percent level.

**Significant at 95 percent level.

workers that the premium associated with the Matric certificate and the BA degree is higher than the premium associated with the Professional Degree.

To extend the analysis, we add diploma dummies in the spline equations for both male and female workers and the estimated results are presented in Table 12. It is observed that same diploma dummies are statistically significant in these equations. Our results suggest that in Pakistan, productivity of workers is more

Table 12

Earning Functions: Diploma Effect

Variable	Male Workers		Female Workers	
	Coefficient	<i>t</i> -ratios	Coefficient	<i>t</i> -ratios
Constant	5.314***	92.79	6.539***	90.93
EXP	0.041***	16.23	0.042***	22.21
EXP ²	-0.001***	-13.75	-0.001***	-15.10
URBAN	0.205***	9.41	0.192***	6.59
MSP	0.182***	6.57	0.182***	6.07
BALOCH	0.153***	4.82	0.148***	3.27
NWFP	-0.141***	-4.72	-0.129***	-3.84
PUNJAB	-0.180***	-7.33	-0.155***	-7.58
RWA	0.036***	3.54	0.010**	2.25
Yrs-Prim	0.001	1.32	0.0007	0.81
Yrs-Mid	0.053***	6.34	0.023***	6.09
Yrs-Mat	0.175***	16.19	0.121***	15.32
Yrs-Inter	0.231***	17.33	0.244***	17.29
Yrs-BA	0.267***	28.37	0.394***	25.61
Yrs-Prof	0.593***	31.65	0.610***	30.90
Dip-Prim	0.005	0.49	0.009	0.58
Dip-Mid	0.008	1.20	0.015	1.03
Dip-Mat	0.131***	3.04	0.101***	9.26
Dip-Inter	0.003	0.95	.047	1.28
Dip-BA	0.218***	7.83	0.113***	5.32
Dip-Prof	0.042	0.74	0.136**	2.58
PRIVATE	0.229***	6.68	0.271***	8.58
TRAINL1	0.001	0.83	-	-
TRAINL3	0.011	1.25	-	-
TRAIN3+	0.046***	4.20	-	-
Adj R ²		0.368		0.491
F-statistics		72.95		62.38
Sample		4375		453

Source: PIHS 1995-96.

***Significant at 99 percent level.

**Significant at 95 percent level.

important than the role of education as a screening device. These results are not in line with Shabbir (1991), who found all diploma years statistically significant for male workers and concluded in favour of education as a screening device. In this study, only the Matric certificate and the BA/BSc degree are found to be playing the screening role and providing a significant wage premium.

From the above discussion, it is clear that human capital significantly affects earnings for both male and female workers. Females earn lower as compared to male workers but this disadvantage can be overcome by providing them adequate education, by putting them in quality schools. The implementation of the law and the monitoring system of labour market is essential to ensuring fair treatment of females in the labour market. Because training enhances productivity, special programmes should be designed for females. There are very limited training facilities and, therefore, proportionate opportunities exist for female workers. These programmes can ensure improvement in the status of women in the Pakistani labour market.

V. CONCLUSION AND POLICY IMPLICATIONS

This paper investigates the role of education, experience, literacy and numeracy skills, technical training, and school quality in the earnings of regular wage and salaried persons in Pakistan. Due to the lack of appropriate data, the previous studies are lacking in observing the role of these variables in earnings. As the PIHS, 1995-96 provides information on completed school years, therefore this paper not only estimates the Mincerian earnings function but also examines the returns to education at different stages of schooling, i.e., how much increase in earnings takes place with an additional year of education at specific levels, such as Primary, Middle, Matric, Intermediate, Bachelor's, and Master's.

The analysis confirms the role of education as a productivity-enhancing device rather than screening device. The estimates based on Mincerian specifications show that each year of education brings approximately 8 percent returns for wage-earners. The estimates based on spline in years of education indicate that additional year of schooling at each school level brings a significant rise in earnings. The results show that higher earnings are found to be associated with higher levels of education. Due to gender-based structural differences in earnings, separate models are estimated for male and female workers. The results show that female workers receive lower earnings as compared to male workers for their education and experience. This could be the result of discrimination against them in the labour market either by paying them lower wages or allocating them jobs which are structurally low-paying.

The effects of literacy and numeracy skills are found to be large and significant for male workers but small for female workers. Male workers receive 10 percent higher wages for all three skills as compared to those who do not possess any of these skills, while females get only 3 percent returns. Because most of the low-

skilled workers are employed in the informal sector, therefore a higher level of discrimination against females is evident. The inclusion of this variable drastically reduces the returns to education for Primary school years and makes it insignificant. This implies that those who obtain literacy and numeracy skills without attending Primary school get the reward of these skills in terms of higher earnings as compared to those who have attended Primary school but do not have any of these skills.

The impact of technical training is found to be positive and significant for male workers. The estimates show that more than three years of technical training brings 4.2 percent increase in earnings. However, there is no significant impact of training which is less than three years. The analysis is restricted to only male workers because very few females have completed technical training. The results endorse the productivity theory that human capital enhances the skill level and benefits workers by securing higher wages. The impact of private schooling is also found significant for workers. Females get relatively higher returns if they graduated from private schools as compared to the returns for males. This indicates that the quality of education has significant bearing in the labour market and employers intend to treat their employees fairly and equally irrespective of their sex. The results of this study fully endorse the productivity-enhancing role of education. The results show that workers get reward for all those traits which enhance their productivity.

Our results are indicative of the fact that education has an important role in the development process of the country as it increases the productivity of the workers which is an essential ingredient of growth. Pakistan has to go a long way, however, to reap the benefits of the education because of the low literacy level and lack of purpose in the education system of the country. Currently, Pakistan spends only 2.4 percent of its GDP on education and is far short of the UN-recommended amount of 4 percent. The education policy of 1998-2010 envisages a literacy level of 100 percent in the year 2010 and an increase in the education budget to 4 percent of the GDP. The Government of Pakistan also plans to provide equal and fair educational opportunities to females in the country. These goals have great merit and need substantial investments and focussed efforts to have positive outcomes.

On the basis these results, we draw some policy implications which may be of use to policy-makers and programme managers interested in bringing about a practical change in the system. First, a large and significant impact of literacy and numeracy skills highlights the importance of these skills in the labour market. Therefore, immediate attention should be paid for enhancing literacy and numeracy skills through formal as well as informal education. This may not put a big strain on government resources because all those having some education should be given the responsibility of teaching these basic skills with some kind of incentives. This way, the resources can be optimally utilised through a more effective and efficient mode of education, which may minimise the wastage in the education department.

Second, a positive and significant association between earnings and a higher level of technical training implies that such institutions should be enhanced and strengthened in order to train individuals on modern lines to cope with the rapid changes of technology. There is a dire need to keep workers updated about these technological advancements through high-quality technical training in their respective fields. The emphasis should be more on the long-term training, i.e., three or more years, because less than three years of training is found statistically insignificant. As there are very limited training facilities for females, preference should be accorded to such institutions where both male and female workers can be trained. This way, females will also get a chance to enhance their skills and work side by side with their male counterparts. This will contribute towards lessening gender inequality, and also to resolution of issues relating to discrimination against females in the labour market.

Third, more emphasis should be placed on market-oriented approach to education. The effectiveness of the private school system for both male and female workers is a ready example for developing such an approach. This approach should be introduced at the early school level to get extended benefits. It requires overhauling of the public school system not only in terms of curriculum, teaching methods, and other quality inputs, but also introducing a goal-oriented education programme in the country. In this regard, special emphasis should be placed on teacher training. Unfortunately, in Pakistan, low educational requirements for teaching positions and extremely low salaries offered to the teachers, especially at the primary level, reflect the low level of priority accorded to basic and elementary education.

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