

## Changes in Returns to Education in Pakistan: 1990-2002

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### Abstract

*This paper examines the trends in marginal rates of return to various levels of education for paid employees and how rewards for additional investments at a particular level of education has changed over time. Although the findings are indicative of increasing returns at different educational levels (excluding Graduation) over the years, we find no evidence that additional investments at successive levels bring consistently higher returns as highlighted by certain previous studies in Pakistan. The changes in returns at the primary and pre secondary levels have been found to be miniscule, taking the time span into consideration. The paper has also examined the returns to education between males and females and across urban and rural areas in view of the large disparities that exist by gender and region. Our findings indicate that although the wage structure may be biased in favour of males, additional investments made in female education accrue higher returns in comparison to males. Moreover, higher education is better rewarded in the urban areas whereas medium of instruction is a significant indicator of earning differentials in the labour market.*

### 1. Introduction

Since the pioneering work on the productivity of workers vis-à-vis human capital, Becker (1964) and Mincer (1974), have paved the way for numerous studies examining different aspects of earning differentials in the labour market<sup>1</sup> (see for example Psacharopoulos and Ying Chu Ng 1992; Ryoo, J. et al 1993; Psacharopoulos 1994; Alba-Ramirez and Segundo 1995; Weisberg 1995; Stanovnik 1997; Bartolo 1999; Arabsheibani and Manfor

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<sup>1</sup> These studies have focused on two major aspects: rates of return to education and age-earnings profile. The first approach examines the returns to education by attainment of schooling, experience and other variables. The second approach focuses on the relationship between earnings and age i.e. how earnings profile vary according to age cohorts.

2000). The Mincer equation to estimate private returns to education has become a 'showcase' in economics, a theoretical model quite amenable to empirical verification. However, in Pakistan there is a severe lack of literature on the subject.<sup>2</sup> Moreover, the scope of previous work has been mainly confined to estimating static returns to education for specific years<sup>3</sup> (see for example Shabbir and Khan 1991; Nasir 2002). Since returns to education tend to fluctuate due to changes in earnings and labour market dynamics over the years, the static approach does not refer to these fluctuations and may be a poor predictor not encompassing labour market developments.

The objective of this paper is to examine the changes in private rates of return to paid employees possessing different levels of human capital represented by education and empirically measured by levels of educational attainment over the period 1990-2002. The data used for the study has been acquired from the Pakistan Integrated Household Survey (PIHS) 1990-91 and 2001-02 published by the *Federal Bureau of Statistics*. Both surveys include information on the highest level of education completed and school starting age of individuals, which were missing in earlier surveys.<sup>4</sup> The paper also estimates differentials in marginal returns to education by gender and region for 2001-02.

The paper has been organised in six sections including the present one. In section 2, the structure and profile of education has been briefly discussed. It also includes background information on the labour market in Pakistan. Section 3 presents information on data, the theoretical model and research design of the study. Section 4 examines the changes in returns over time. Section 5 presents empirical findings of returns across gender and regions for 2001-02. The last section concludes and provides certain policy recommendations.

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<sup>2</sup> The reason seems to be the inadequacy of relevant data as most micro-level surveys conducted in the country lacked appropriate information to estimate the Mincer equation (see Shabbir 1994). For instance, these surveys do not report individual schooling years as a continuous variable but rather as a discrete response variable with responses such as Primary and Incomplete Middle, Middle and Incomplete Matric, Matric and Incomplete Intermediate and so forth. Therefore, most of the previous studies have estimated returns using discrete variables for different levels of education in Pakistan (see for example Guisinger et al. 1984; Khan and Irfan 1985; Ahmed et. al 1991; and Ashraf and Ashraf 1993a, 1996).

<sup>3</sup> The only exception is Ashraf and Ashraf (1993b), which has estimated earning differentials by gender for 1979 and 1985-86. However, these data sets are quite outdated.

<sup>4</sup> In addition, information on type of schools which individuals attended and the medium of instruction used in schools is also available in the two surveys.

## **2. Structure and Profile of Education and Labour Market in Pakistan**

The education structure in Pakistan includes primary to professional level of education, which has been similar across all the four provinces. Primary education is for five years; middle or pre-secondary comprises three years and secondary or matriculation level includes ten years of schooling. After completion of secondary education, individuals have the option either of continuing two years of formal education leading to higher secondary school certificate (or intermediate level) or to enroll in a technical institution for a three years diploma programme. The higher secondary school is the gateway to either enrolling in professional colleges<sup>5</sup> or to continue two additional years of general education leading to Graduation. Those who complete their general education can pursue a Masters or Postgraduation degree from a university for two additional years. After completion of Postgraduation, individuals can proceed with an M.Phil and later PhD.

In public schools, lessons are mostly taught in Urdu, the national language, whereas English is learned as a second language. Since education is a provincial subject in Pakistan, in certain provinces local languages are also used as a medium of instruction in public schools at the primary, pre secondary and secondary levels. On the other hand, private schools predominantly use English as a medium of instruction and are generally considered as more quality oriented in terms of pedagogy, textbooks, and physical infrastructure.<sup>6</sup> At higher educational levels i.e. graduation, post graduation and professional education, the system is more or less uniform and the curriculum mostly taught in English.

The educational profile of Pakistan in the last ten years has somewhat improved. The national literacy rate has increased from 34.9 per cent in 1990 to 49 percent in 2001 with consistent improvements across gender.<sup>7</sup> Net enrollment rates which are significantly low in Pakistan have

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<sup>5</sup> After completion of higher secondary, the professional degree of engineering entails four years of education whereas medicine and law degrees require five years. For our analysis, we have assumed that professional education entails five years of education after higher secondary.

<sup>6</sup> The role of the private sector in the provision of education basically emerged since the early 1980s. However its most significant growth has been witnessed since the 1990s when the sector started educational provision at virtually all levels of education including higher and professional education.

<sup>7</sup> In the last decade, the male literacy rate has increased from 36.8 per cent in 1990 to 61.3 percent in 2001. On the other hand, female literacy has improved from 22.4 per cent during the 1990s to 43.9 percent in 2001. However, these figures are still substantially low if compared to similar per-capita income countries in South Asia.

improved in marginal terms at the primary, pre secondary and secondary levels of education during 1990-2002. At the primary level, net enrollment increased from 33 per cent in 1990-91 to 37 per cent during 2001-02 whereas enrollments at the pre secondary and secondary level of education have improved from 19 and 17 per cent to 20 and 18 per cent respectively for the same time period. With marginal improvements in the country's educational profile, vast disparities in enrollments continue to exist across gender, regions and provinces. The inter-provincial budgetary allocations, inaccessibility of schools among regions, socio-economic factors and ethnic and cultural norms are certain factors responsible for existing educational disparities in the country (Sarmad *et al* 1988). Particularly in the rural areas, the differences between net enrollments of boys and girls have been substantial at the primary, pre secondary, and secondary levels of education. Moreover, enrollments at the pre secondary and secondary levels of education in urban settings are twice as high compared to rural areas.<sup>8</sup>

## 2.1 Pakistan's Labour Market

The sectoral distribution of workers and labour force participation rates provide an overview of the structure of the labour market in Pakistan. Similar to other developing countries, Pakistan's labour market is dual in character possessing both flexibility and inflexibility in response to economic adjustments. The formal sector is less flexible and resists downward movements in wages and employment because even the unskilled workers in the sector are protected either by government regulations or trade union activities (Nasir 2001). The informal sector is more flexible and adaptive to economic changes and is characterised by its high labour intensity, low-technology orientation and human capital requirement. Hence, both labour productivity and wages are low in contrast to the formal sector. The informal sector, which has rapidly increased in the last decade, accounts for 65.8 per cent of the non-agriculture employed labour force in 1999-2000.<sup>9</sup>

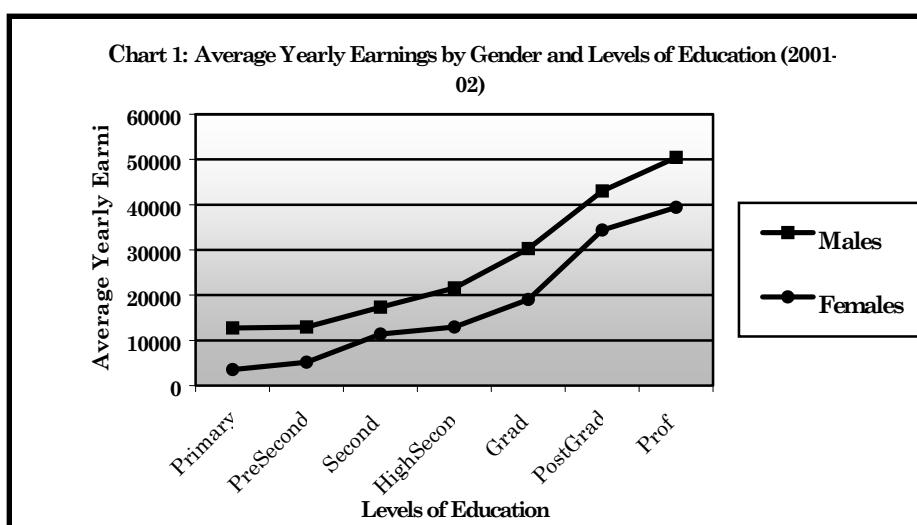
In Pakistan, the labour force participation rate is considerably low and has declined in the last decade from 43.16 per cent in 1990-91 to 42.8 per cent in 1999-2000. While male participation rates declined from 71.2 per cent in 1990-91 to 70.4 per cent in 1999-2000, participation rates of women have increased from 12.76 per cent to 13.7 per cent in 1999-2000. Though female labour force participation is significantly low in Pakistan, the trend however indicates that substitution of employment has taken place in

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<sup>8</sup> For details, see PIHS, Round 4: 2001-02.

<sup>9</sup> Region-wise, the sector accounts for 68 and 63.4 per cent of the employed share in rural and urban settings respectively.

the labour market indicating increased employment opportunities for women. Since there has been no nationally representative wage level data available in Pakistan, Chart 1 presents PIHS derived estimates indicating that female wages are lower than those of males, irrespective of similar levels of education. The reason appears to be the concentration of women in occupations that are structurally low paying rather than any wage discrimination against them in the labour market.<sup>10</sup>



Source: PIHS 2001-02.

### 3. Data Description, Model and Research Design

The PIHS 1990-91 comprises 4,800 households with a sample size of 36,071 individuals whereas PIHS 2001-02 consists of 16,812 households and a sample size of 116,724 individuals. For our analysis, the sample has been confined to paid employees and salaried persons of 15-60 years, the working age in Pakistan. The rationale for restricting the sample was that earnings of paid employees closely reflect the productivity of workers relative to other categories of workers in the surveys. In addition, this sample specification also implies that child workers and those who work after retirement are excluded from the analysis for similar reasons. After cleaning the data, the sample size of paid employees comes to 3,708 in 1990-91 of which 3,378

<sup>10</sup> This specifically refers to formal sector employment. In the informal economy, it may be presumed that female wages are lower than those of males because of labour market discrimination against them based on findings that since women demand lower wages, there is a greater tendency to hire them (for details see Kazi 1999).

were males and 330 females. For 2001-02, the sample consists of 12,814 individuals, 10,842 males and 1,972 females.

Although, the estimated potential experience used by Mincer (1974) is a good proxy for actual experience in the United States because schooling starts at a uniform age of six years, however in Pakistan, this assumption does not hold because of variations in age when schooling starts.<sup>11</sup> Moreover, Mincer's method of calculating potential experience becomes inappropriate for our analysis in cases where an individual's completed years of schooling is significantly low in comparison to the individual's age. This method calculates a fairly high potential experience unfeasible in Pakistan's labour market for salaried workers.<sup>12</sup> To correct the problem, two separate methods have been formulated. For wage earners having less than secondary schooling, potential experience has been calculated as – age of individual minus 15 – which assumes that the paid employee has entered the job market at the age of 15 years. On the other hand, individuals with a minimum of secondary level of education, the potential experience is measured as – age of individual minus total years spent in school minus age at which schooling started.

Descriptive statistics of the two samples are provided in Table 1 (Annexures). There has been no significant difference in mean years of schooling (including all levels) over the years indicating that educational attainment has not improved much since 1990-91. From an average of 5 years, it has slightly increased to 5.33 years in 2001-02. Likewise, mean experience of individuals has increased in marginal terms from 16.5 years (1990-91) to 17 years (2001-02). Average nominal wage of an individual has increased from Rs. 19,832 per annum in 1990-91 to Rs. 34,367 per annum in 2001-02. More than 60 per cent of the sample in 1990-91 belongs to urban areas compared to 49 per cent in 2001-02. The proportion of private school graduates in the sample is a mere 2 per cent which has remained unchanged since 1990-91. Individuals who have graduated from English medium institutions have increased slightly in 2001-02.

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<sup>11</sup> In the urban areas of Pakistan, schooling usually starts at the age of three years whereas in the rural settings, the school starting age ranges from 5-7 years.

<sup>12</sup> For example, if a person is fifty years of age, has spent three years in school and was four years of age when his schooling started, the potential work experience of this particular individual comes to forty seven years. For regular wage employees and salaried persons whose retirement age is sixty years, this is a substantially high level of potential experience.

### 3.1 The Theoretical Model

The extended form of Mincer (1974) has been applied to estimate returns for different educational levels presented as

$$\begin{aligned} \ln Y = & \beta_0 + \beta_1 \text{Prim} + \beta_2 \text{PreSecond} + \beta_3 \text{Second} + \beta_4 \text{HiSecond} \\ & + \beta_5 \text{Grad} + \beta_6 \text{PGrad} + \beta_7 \text{Prof} + \beta_8 X + \beta_9 (X)^2 + \beta_{10} \text{URBAN} + \beta_{11} \text{MALE} \\ & + \beta_{12} \text{PRIVATE} + \beta_{13} \text{ENGLISH} + \beta_{14} \text{SINDH} + \beta_{15} \text{NWFP} + \beta_{16} \text{BALOCH} + u_i \dots \dots \dots \end{aligned} \quad \text{(i)}$$

Where  $\ln Y$  is the natural log of yearly earnings,  $\beta_1$  to  $\beta_7$  are the estimated coefficients from primary to professional level of education.  $\beta_8$  estimates returns to potential experience whereas  $\beta_9$  captures the non-linearity in the experience-earnings profile.  $\beta_{10}$  is the coefficient of discrete variable 'URBAN', indicating if an individual belongs to the urban area,  $\beta_{11}$  captures the effect by Gender,  $\beta_{12}$  is the coefficient of discrete variable PRIVATE if an individual has graduated from a private school and  $\beta_{13}$  is the coefficient for medium of instruction.  $\beta_{14}$  to  $\beta_{16}$  measures the provincial effect by discrete variables, Punjab being the excluded category.

The estimated coefficients of levels of education obtained from equation (i) enable us to calculate marginal rates of return for each additional completed level of education as estimated by Duraisamy (2000) in the case of India, where the education structure is somewhat similar to Pakistan.

$$R_k = (\beta_k - \beta_{k-1}) / S_K \dots \dots \dots \quad \text{(ii)}$$

Where  $\beta_k$  is the coefficient value of  $K_{th}$  level of education,  $\beta_{k-1}$  is the coefficient of previous level of education to  $K$  and  $S_K$  is the additional years of schooling spent to complete  $K_{th}$  level of schooling. Description of education levels has been presented in Table 2 in the Annexures.

### 4. Change in Returns to Education: 1990-2002

The change in marginal rates of return to levels of education in Pakistan have been presented in Table 4 in the Annexures calculated by

using (ii). The results indicate that excluding Graduation, returns at all levels of education have increased since 1990. However, there has been no evidence that attainment of an additional level of education results in consistently increased growth in earnings.

At the primary and pre secondary levels, marginal returns are substantially low for both time periods with a minuscule change over the years. At the primary level, private returns have increased by only 1.14 percentage points whereas at the pre secondary level returns increased by a mere 0.03 percentage points in 2001-02 compared to 1990-91. These results suggest that attainment of five years of basic education makes an insignificant difference in earnings compared to illiterates and completion of pre secondary or middle level certification have little returns in comparison to primary education.

At the secondary level, estimated returns for both time periods are significantly high compared to pre secondary increasing from 11.3 per cent in 1990-91 to 13.4 per cent in 2001-02. However, at the higher secondary level, growth in earnings has been found to be less than that for secondary for both time periods with increase in marginal returns by 3.35 percentage points. Importantly Graduation is the only category where returns have declined by 3 percentage points, although attainment of Graduation results in 15.6 per cent growth in earnings compared to higher secondary education in 2001-02. The most marked change has been observed at the postgraduate level where returns have more than doubled from around 7 per cent (1990-91) to 14.6 per cent (2001-02). At the professional level, the findings indicate a minuscule change in returns of 0.86 percentage points in 2001-02 suggesting that general education at higher levels is more rewarding than professional education.

The empirical results by region confirm the *a priori* expectation that returns in urban areas are higher than those in rural areas and over time the rural-urban difference has increased significantly, indicated by the positive and significant coefficient value. Likewise, earning differential between males and females has also increased during this time, which is indicative of the fact that males have higher wages than females for reasons mentioned earlier.

Rate of returns to private schooling show a positive and significant impact of quality of schooling on individual earnings. The higher coefficient value of private institutions in the later period indicates that returns to private education compared to the public sector have increased enormously. Likewise, the positive and significant sign of English as a medium of instruction reveals



that the English language is a significant indicator of earning differential in Pakistan's labour market; however, the relatively small coefficient value in 2001-02 implies that this difference has reduced over the years.

The dummies used to capture the differences by provinces provides a surprising result. Earnings in Balochistan, the most remote province in Pakistan, have been found to be greater than those in Sindh, NWFP and the Punjab. This is a sample selection error in the survey data not reflecting the labour market dynamics in Balochistan province. However, other results confirm our expectations pertaining to provincial differences.

## **5. Empirical Results by Gender and Region 2001-02**

### **5.1 Returns to Education by Gender**

Private returns to levels of education for 2001-02 by gender have been presented in Table 6 (see Annexures). Interestingly, marginal returns to additional levels of female education have been found to be significantly higher than those to males at all levels of education. This is contrary to the earlier findings which suggest that additional levels of male education accrue better rewards than those of female education (see Nasir 2002). Although female earnings are low compared to those of males irrespective of the same educational levels, our results suggest that additional investments made in female education have higher pecuniary rewards. The returns at the primary level of education for males have been found to be approximately 2 per cent compared to 4.3 per cent for females. These estimates corroborate the earlier finding that returns to five years of basic schooling are significantly low. At the middle level, a significant difference has been with a differential of 12.5 percentage points. However, at the secondary level, we observe the maximum difference across gender where returns to female education are approximately three times higher than those to males. Likewise, at higher levels of education including graduation, post graduation and professional education, returns for females have been found to be substantially higher. The reason for higher female returns seems to be their low participation rates in the workforce. Contrary to educational returns, male experience is more highly rewarded because of foregone time spent in reproductive responsibilities. Moreover, the differentials in female earnings across regions have been estimated to be higher than those of males i.e. females in urban areas earn significantly more than those residing in rural areas compared to regional differentials for males. Likewise, returns to private schooling by gender indicate that females have higher returns than males graduated from private schools. Importantly, in the case of females, the medium of instruction has been found to be insignificant.

## **5.2 Returns to Education by Region**

The results by region find no statistical difference between primary school graduates and urban illiterates whereas marginal returns in rural areas are 4.3 per cent at the same level. (See Table 8 in Annexures). Interestingly, marginal returns at the secondary level of education in rural areas have been found to be twice as high as compared to urban areas. At higher educational levels i.e. from higher secondary to professional education, returns have been found to be greater in urban areas compared to rural areas as expected because of more skill demanding jobs in cities. Private education is significant for both urban and rural areas whereas medium of instruction is only significant in the rural areas.

## **6. Conclusion**

The findings of the paper indicate that each additional level of educational attainment does not result in consistently higher returns as indicated by previous studies of educational returns in Pakistan. The insignificant increase in marginal returns at the primary and secondary levels signifies that lower human capital accumulation vis-à-vis education does not provide sufficiently high pecuniary benefits compared to illiterates and primary educated respectively. It raises a serious concern because of low enrollments and high dropout rates at the primary level in Pakistan. Therefore, concerted efforts are required to universalise primary education with incentives to promote investments in education at higher levels. Higher education is better rewarded in urban areas because of demand-side factors.

Female education is more rewarding compared to male education implying that additional investments in female education yield higher returns. Furthermore, positive externalities associated with female education develop a strong case of making higher investments in female education both at the macro and micro levels. Moreover, higher returns have been observed for the private sector signifying the need to enhance the quality component of the public sector. As a result of resource constraints, the quality of public sector education has been consistently declining and requires substantial overhauling with reference to curriculum, pedagogy, textbooks and other quality-oriented innovations.

## ANNEXURES:

Table 1: Mean Sample Characteristics

|             | 1990-91  |         | 2001-02  |          |
|-------------|----------|---------|----------|----------|
|             | Mean     | SD      | Mean     | SD       |
| WAGE        | 19832.19 | 24531.7 | 34367.73 | 33848.50 |
| EXPERIENCE  | 16.5     | 11.67   | 17.0     | 11.59    |
| AGE         | 31.99    | 11.67   | 32.65    | 11.65    |
| SCHOOLING   | 4.97     | 5.04    | 5.33     | 5.32     |
| MALE        | 0.91     | 0.28    | 0.85     | 0.36     |
| PRIVATE     | 0.02     | 0.14    | 0.02     | 0.15     |
| URBAN       | 0.61     | 0.49    | 0.49     | 0.50     |
| ENGLISH     | 0.02     | 0.14    | 0.03     | 0.17     |
| PUNJAB      | 0.48     | 0.49    | 0.38     | 0.48     |
| SINDH       | 0.30     | 0.46    | 0.32     | 0.47     |
| NWFP        | 0.15     | 0.36    | 0.14     | 0.34     |
| BALUCHISTAN | 0.07     | 0.26    | 0.16     | 0.37     |
| N           |          | 3705    |          | 12814    |

Source: *Pakistan Integrated Household Survey*

Table 2: Description of Education Levels

| Levels           | Definition  |
|------------------|---|
| Primary          | Five and greater but less than eight years of schooling       |
| Pre Secondary    | Eight and greater but less than ten years of schooling        |
| Secondary        | Ten years and greater but less than twelve years of schooling |
| Higher Secondary | Twelve and greater but less than fourteen years of schooling  |
| Graduation       | Fourteen and greater but less than sixteen years of schooling |
| Post graduation  | Sixteen years of schooling                                    |
| Professional     | Years spent in Medicine, Engineering, and Law etc.            |

**Table 3: OLS Estimates of Wage Equation, 1990-91 and 2001-02**

|                  | 1990-91 |         | 2001-02 |         |
|------------------|---------|---------|---------|---------|
|                  | Coeffi. | t-value | Coeffi. | t-value |
| CONSTANT         | 8.023   | 172.352 | 7.577   | 298.333 |
| EXP              | 0.053   | 16.935  | 0.068   | 33.602  |
| EXP SQUARE       | -0.0005 | -13.238 | -0.0011 | -23.802 |
| URBAN            | 0.128   | 5.962   | 0.295   | 21.479  |
| MALE             | 0.862   | 23.547  | 1.419   | 75.828  |
| PRIVATE SCHOOL   | 0.119   | 1.647*  | 0.234   | 5.00    |
| ENGLISH MEDIUM   | 0.379   | 4.779   | 0.278   | 6.119   |
| PRIMARY          | 0.104   | 2.684   | 0.161   | 6.654   |
| PRE SECONDARY    | 0.174   | 5.754   | 0.240   | 11.305  |
| SECONDARY        | 0.400   | 12.202  | 0.508   | 24.401  |
| HIGHER SECONDARY | 0.573   | 12.348  | 0.748   | 27.039  |
| GRADUATION       | 0.947   | 19.950  | 1.060   | 35.387  |
| POSTGRADUATION   | 1.085   | 13.496  | 1.352   | 35.571  |
| PROFESSIONAL     | 1.174   | 10.140  | 1.392   | 19.278  |
| SINDH            | 0.09    | 3.752   | 0.180   | 11.632  |
| NWFP             | -0.066  | -2.163  | 0.032   | 1.544** |
| BALOCHISTAN      | 0.306   | 7.394   | 0.421   | 21.049  |
| N                |         | 3704    |         | 12813   |
| ADJUST R-SQUARE  |         | 0.354   |         | 0.530   |

\* Significant at 0.10 level of significance

\*\* Significant at 0.20 level of significance

**Table 4: Trends in Returns to Education Levels 1990-2002**

|                  | 1990-91 | 2001-02 |
|------------------|---------|---------|
| PRIMARY          | 2.1     | 3.22    |
| PRE SECONDARY    | 2.3     | 2.63    |
| SECONDARY        | 11.3    | 13.4    |
| HIGHER SECONDARY | 8.7     | 12.0    |
| GRADUATION       | 18.7    | 15.6    |
| POSTGRADUATION   | 6.9     | 14.8    |
| PROFESSIONAL     | 12.0    | 12.9    |

Calculated from Table 3

Table 5: OLS Estimates of Wage Equation by Gender, 2001-02

|                  | MALES   |         | FEMALES |         |
|------------------|---------|---------|---------|---------|
|                  | Coeffi. | t-value | Coeffi. | t-value |
| CONSTANT         | 9.095   | 463.120 | 7.248   | 91.130  |
| EXP              | 0.074   | 41.122  | 0.047   | 5.787   |
| EXP SQUARE       | -0.0013 | -30.111 | -0.0006 | -2.933  |
| URBAN            | 0.216   | 17.870  | 0.585   | 10.407  |
| PRIVATE SCHOOL   | 0.150   | 3.617   | 0.290   | 1.595*  |
| ENGLISH MEDIUM   | 0.299   | 7.526   | 0.156   | 0.839   |
| PRIMARY          | 0.095   | 4.568   | 0.217   | 1.839*  |
| PRE SECONDARY    | 0.162   | 9.084   | 0.659   | 5.109   |
| SECONDARY        | 0.377   | 21.055  | 1.273   | 13.044  |
| HIGHER SECONDARY | 0.571   | 23.620  | 1.515   | 13.028  |
| GRADUATION       | 0.837   | 31.300  | 1.948   | 17.391  |
| POSTGRADUATION   | 1.077   | 32.005  | 2.524   | 17.272  |
| PROFESSIONAL     | 1.071   | 16.671  | 2.630   | 9.706   |
| SINDH            | 0.168   | 11.804  | 0.256   | 4.498   |
| NWFP             | -0.081  | -4.479  | 0.552   | 5.403   |
| BALUCHISTAN      | 0.356   | 20.734  | 0.574   | 5.949   |
| N                |         | 10841   |         | 1971    |
| ADJUST R-SQUARE  |         | 0.410   |         | 0.446   |

\* Significant at 0.2 level of significance

Table 6 : Marginal Returns to Levels of Education by Gender, 2001-02

|                  | MALES | FEMALES |
|------------------|-------|---------|
| PRIMARY          | 1.9   | 4.3     |
| PRE SECONDARY    | 2.2   | 14.7    |
| SECONDARY        | 10.8  | 19.9    |
| HIGHER SECONDARY | 9.7   | 12.1    |
| GRADUATION       | 13.3  | 21.6    |
| POSTGRADUATION   | 12.0  | 28.8    |
| PROFESSIONAL     | 10.0  | 22.3    |

Calculated from Table 5

**Table 7: OLS Estimates of Wage Equation by Region, 2001-02**

|                  | URBAN   |         | RURAL   |         |
|------------------|---------|---------|---------|---------|
|                  | Coeffi. | t-value | Coeffi. | t-value |
| CONSTANT         | 8.12    | 227.91  | 7.371   | 223.141 |
| EXP              | 0.077   | 26.525  | 0.058   | 21.232  |
| EXP SQUARE       | -0.0012 | -18.02  | -0.001  | -15.798 |
| MALE             | 1.087   | 42.073  | 1.764   | 67.123  |
| PRIVATE SCHOOL   | 0.199   | 3.994   | 0.395   | 3.063   |
| ENGLISH MEDIUM   | 0.303   | 6.059   | 0.075   | 0.694*  |
| PRIMARY          | 0.0458  | 1.269*  | 0.217   | 6.892   |
| PRE SECONDARY    | 0.205   | 7.192   | 0.251   | 8.172   |
| SECONDARY        | 0.388   | 13.478  | 0.600   | 20.569  |
| HIGHER SECONDARY | 0.696   | 19.488  | 0.753   | 17.696  |
| GRADUATION       | 1.023   | 27.787  | 0.996   | 19.697  |
| POSTGRADUATION   | 1.328   | 29.224  | 1.103   | 6.068   |
| PROFESSIONAL     | 1.360   | 17.370  | 1.213   | 17.812  |
| SINDH            | 0.174   | 8.017   | 0.189   | 8.460   |
| NWFP             | -0.039  | -1.281* | 0.0578  | 2.035   |
| BALUCHISTAN      | 0.269   | 8.825   | 0.491   | 18.993  |
| N                |         | 6248    |         | 6564    |
| ADJUST R-SQUARE  |         | 0.485   |         | 0.567   |

Significant at 0.05 level except those noted by \*

**Table 8: Marginal Returns to Levels of Education by Region, 2001-02**

|                  | URBAN | RURAL |
|------------------|-------|-------|
| PRIMARY          | 0.9   | 4.3   |
| PRE SECONDARY    | 5.3   | 1.1   |
| SECONDARY        | 9.2   | 17.5  |
| HIGHER SECONDARY | 15.4  | 7.7   |
| GRADUATION       | 16.4  | 12.2  |
| POSTGRADUATION   | 15.3  | 5.4   |
| PROFESSIONAL     | 13.3  | 9.2   |

Calculated From Table 7

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