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“Schooling is Associated Not Only with Long-Run Wages,
But Also with Wage Risks and Disability Risks:
The Pakistani Experience”

by

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Schooling is Associated Not Only with Long-Run Wages, But Also with Wage Risks and Disability Risks: The Pakistani Experience

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Abstract

Many studies document significantly positive associations between schooling attainment and wages in developing countries. But when individuals enter occupations subsequent to completing their schooling, they not only face an expected work-life path of wages, but a number of other occupational characteristics, including wage risks and disability risks, for which there may be compensating wage differentials. This study examines the relations between schooling on one hand and mean wages and these two types of risks on the other hand, based on 77,685 individuals from the wage-earning population as recorded in six Labor Force Surveys of Pakistan. The results suggest that schooling is positively associated with mean total wages and wage rates, but has different associations with these two types of risks: Disability risks decline as schooling increases but wage risks, and even more, wage rate risks increase as schooling increases. The schooling-wage risks relation, but not the schooling-disability risks relation, is consistent with there being compensating differentials.

Key words: Wages, Risks, Labor Markets, Job Disabilities, Compensating Differentials, Developing Country, Schooling

JEL Codes: J31, J28, O53

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1 Introduction

Many studies document significantly positive associations between schooling attainment and wages in developing countries (see the reviews in Psacharopoulos 1985, 1994 and Psacharopoulos and Patrinos 2004). Based in part on these associations, there has been widespread advocacy for increasing schooling in developing countries to increase productivity and income and, if targeted towards poorer households, reduce poverty and inequality.

But when individuals enter occupations subsequent to completing their schooling, they not only face an expected work-life path of wages, but also other occupational characteristics, including wage risks and disability risks, for which there may be compensating wages differentials. This has been recognized in some of the recent (as well as older) literature on schooling and labor markets in developed economies. Christiansen, et al. (2006), for example, estimated the risk-return trade-off for different schooling attainment and types of schooling based on the Danish Labor Force Survey and identified “efficient” and “inefficient” (inferior based only on risks and returns) schooling combinations. Tuor and Backes-Gellner (2010) used the Swiss Labor Force Survey to estimate risk and returns for different types of schooling paths – all leading to a tertiary degree – by distinguishing among a purely academic path, a purely vocational path and a mixed path with loops through both systems, with entrepreneurs separated from employees in order to examine whether for the same schooling the labor market outcomes differ between these two groups. Their empirical results suggest that mixed schooling paths are well-rewarded in the Swiss labor market and for entrepreneurs high returns are associated with high income variance. Diaz-Serrano and Hartog (2006) used the 1995 Spanish Encuesta de Estructura Salarial (Salary Structure Survey) of 1995 to estimate the earnings variance and skewness and found compensating wage differentials for schooling as a risky investment. Low, Meghir and Pistaferri (2008) specify a structural life-cycle model of consumption, labor supply and job mobility in an economy with search frictions that allows them to distinguish among different sources of risks (shocks to productivity, job destruction, processes of job arrival when employed and unemployed and match level heterogeneity) and to estimate their effects and the impact of alternative governmental policies to mitigate risks.

However there is very little evidence in the literature on the associations between schooling attainment and these risks characteristics of occupational choices in developing country contexts, where labor markets may operate much differently than in more developed economies due to, for example, different degrees of mobility and labor market segmentation. The present paper contributes to the literature on developing country labor markets by estimating the associations between schooling and wage risks and between schooling and disability risks in addition to those between schooling and expected wages. These estimates are conditional on the maintained assumption that individuals enter broad occupational categories in specific geographical

locations subsequent to their schooling and there is relatively little subsequent mobility. Data on workers in the most recently available six rounds of the Pakistan Labor Force Survey with 77,685 observations are used for the empirical analysis. The occupational and regional categories used are broad so that, in the context of Pakistan, the assumption of limited mobility seems warranted.

The rest of the paper is organized as follows. Section 2 describes the key data from the Labor Force Surveys used in this study. Section 3 discusses how wage risks and disability risks are defined. Section 4 presents the results. Section 5 concludes.

2 Data

We use pooled data from the six most recent available cross-sectional nation-wide Labor Force Surveys of Pakistan for the years 2001-02, 2003-04, 2005-06, 2006-07, 2007-08 and 2008-09. The Labor Force Survey of Pakistan is conducted by the Federal Bureau of Statistics (FBS), Islamabad. The FBS² collects data throughout the country from all rural/urban localities in four provinces of Pakistan based on the 1998 Population Census, excluding the Federally Administered Tribal Areas (FATA) and the military restricted areas. The population of these excluded areas constitutes about 2% of the total population.

The analysis includes 77,685 observations on individuals of working-age (10-65 years)³ involved in any economic activity in these six surveys for whom we have data on the critical variables for the analysis. The variables for each worker include wages, hours worked, work disability, occupation,⁴ residence (in urban or rural area and in one of the four provinces), schooling attainment, gender and age. Table 1 gives summary statistics for these data. The mean age is 33.8 years. The sample is predominantly male (89.6%), reflecting the very limited female labor force participation rate in Pakistan. Occupation is defined according to the International Standard Classification of Occupations (ISCO) at the level of nine categories. The highest proportions of workers are in elementary/unskilled occupations (19.5%), technicians and associate professionals (19.1%), service and sales workers (15.4%) and craft and related trade occupations (14.5%). There are seven schooling categories, with 22% illiterate having less than primary education and

² The FBS uses a stratified two-stage random sample design for data collection. Each area is divided into urban and rural domains. The enumeration blocks for urban domains and village/mouzas/dehs for rural domains are considered as Primary Sampling Units (PSU). The listed households of sample PSUs are taken as Secondary Sampling Units (SSUs). A specified number of households (i.e. 12 from each urban sample PSU, 16 from each rural sample PSU) are selected with equal probability using a systematic sampling technique with a random start.

³ The Labor Force Survey of Pakistan collects data on economic activity for those above 10 years of age. Only 1.4% of the observations in the data that we use for our analysis below is in the 10-14 age range. Our estimates do not change substantially if these individuals are excluded.

⁴ The occupation variable is not available for individuals who are not employed. Therefore we are not able to incorporate such individuals into our analysis, control for selectivity across occupations in employment, or investigate unemployment risks.

11.3-19.5% in the five categories ranging from completed primary education (seven years) to graduation (15-16 years) and a smaller proportion (6.8%) having attained the post-graduate level.

[Table 1 about here]

3 Measurement of Wages Risks and Disability Risks

We assume that subsequent to schooling, working individuals enter into one of 144 labor market groups defined by occupation, gender, urban/rural, province and gender (144 = 9 occupational categories * 2 gender categories * 2 urban/rural categories * 4 provinces). We use these groups to define the wage risks and the disability risks that the individuals face upon entering into one of these groups subsequent to schooling. That is, we assume that the residuals in relations that we estimate below are, from the point of view of individuals, short-term random shocks, not persistent longer-run factors. To the extent that there are long-run persistent factors known by individuals, our procedures may result in overestimates of the actual risks, but with the time series of cross sections that we have we are not able to explore such a possibility.

Wage Risks: To estimate the wage risks we use the standard deviation of the residuals in a wages⁵ (or earnings) equation for each of the 144 groups defined above. To do so, we first estimate ln wages relations with right-side variables for nine occupational dichotomous variables, one gender dichotomous variable, one urban/rural dichotomous variable, three provincial dichotomous variables, age, age-square and interactions of all the other variables with age and age-squared to allow life-cycle wages patterns to vary with occupation, gender, urban/rural and province:⁶

$$\ln(\text{Wages}) = \alpha + \beta_i X_i + \mu_i, \quad \mu \sim (0, \sigma^2), \quad (1)$$

where X is a vector with the right-side variables described above. We then calculate the standard deviations of the residuals from the estimated ln wages relation for each of the 144 groups defined above and refer to these standard deviations as the “wages risks.”⁷

Because wages are the product of average hourly wage rates and hours worked, we also follow a similar procedure for wage rates and hours worked by estimating:

⁵ Wages used in the paper are real wages. The nominal wages provided in the Labor Force Surveys are deflated by the consumer price index provided by the Ministry of Finance, Government of Pakistan (Economic Survey of Pakistan 2009-10, Chapter 10).

⁶ The extended form of this equation is:

$$\ln(\text{Wage}_{ij}) = \alpha + \beta_{1j} \text{age} + \beta_{2j} \text{agesq} + \beta_{3j} \text{gender} + \beta_{4j} \text{gender} * \text{age} + \beta_{5j} \text{gender} * \text{agesq} + \beta_{6j} \text{region} + \beta_{7j} \text{region} * \text{age} + \beta_{8j} \text{region} * \text{agesq} + \beta_{9j} \sum_{j=1}^4 \text{province} + \beta_{10j} \sum_{j=1}^4 \text{province} * \text{age} + \beta_{11j} \sum_{j=1}^4 \text{province} * \text{agesq} + \beta_{12j} \sum_{j=1}^9 \text{occupation} + \beta_{13j} \sum_{j=1}^9 \text{occupation} * \text{age} + \beta_{14j} \sum_{j=1}^9 \text{occupation} * \text{agesq} + \mu_i$$

⁷ Wages risks = $\sqrt{\frac{1}{n-1} \sum_{i=1}^n (\mu_{ij} - \bar{\mu}_{ij})^2}$, where i refers to the ith individual in the jth group and n is number of observations in each group.

$$\text{Ln(Wage Rate)} = a + b_i X_i + u_i, \quad u \sim (0, \sigma^2) \quad (2)$$

$$\text{Ln(Hours Worked)} = \xi + \lambda_i X_i + v_i, \quad v \sim (0, \sigma^2) \quad (3)$$

We then define “wage rate risks” and “hours worked risks” parallel to “wages risks”, defined above.

Table 2 presents OLS estimates of relations (1)-(3). The graphical presentation of life-time earnings profiles based on gender, provinces, urban/rural and occupations are presented in Figures 1-4. The estimated coefficients of occupational, regional, gender, provincial categories, age and age square confirm an inverted u-shaped life-time earning profile, as has usually been reported in the previous literature. The gender earning gap favoring males is evident from this regression analysis, with this gap increasing over the life cycle. Among the occupational categories, 'Managers, senior officials and legislators' remain the highest earnings category over the life cycle. The earnings of 'Professionals' increase sharply initially with age but there is steep decline as well for older ages. 'Clerks' is one occupational category whose mean earnings remain almost stable throughout the working life.

[Table 2 and Figures 1-4 about here]

The first three columns of Table 3 present summaries of our estimated wages risks, wage rate risks, and hours worked risks by occupation, gender, urban/rural and province. The means for wages risks and wage rate risks are fairly stable for those with low levels of schooling but increase for those with the highest two or three schooling levels. In the case of gender, wages risks are very high for females as compared to their male counterparts, with both wage rates risks and hours worked risks higher. The higher wages risks for females may reflect that a large proportion of working women are in the informal sector without any legally-binding agreements between employers and employees.

[Table 3 about here]

Disability risks: Work accidents are widespread. According to the International Labor Organization (ILO, 2010)⁸, there are 340 million occupational accidents and 160 million victims of work-related illnesses annually, overall in the world. Moreover in the Middle East and Asia ILO region that includes Pakistan (but excludes China and India), work-related accident fatality rates are four-fold more than those observed in industrialized countries.

For our empirical work we define “disability risks” to be the incidence of injuries or illness at the work-place for the same 144 groups defined above.⁹ The fourth column of Table 3 presents summaries of the estimated disability risks by occupation, schooling, gender, urban/rural and

⁸ International Labor Organization (2010), World Statistics: The Enormous Burden of Poor Working Condition. <http://www.ilo.org/public/english/region/eurpro/moscow/areas/safety/statistic.htm> Accessed on April, 8th 2011.

⁹ Hersch (1998) used the same measure of disability risks for different industries.

province. The disability risks tend to have patterns opposite to the wage risks for schooling, occupations and gender. Occupational disability rates are highest in ' Skilled, Agricultural, Forestry and Fishery Workers', ' Craft and Related Trade Workers' and ' Plant/Machine Operators and Assemblers'

Correlations Among Risks Measures: The more correlated are the risks measures, of course, the less is gained by including multiple risks measures in our analysis. On the other hand, the more correlated are the risks the harder it would be to identify the associations of schooling with any one particular type of risks rather than other highly-correlated types. Table 4 gives the correlations among our measures. Note that the wages risks measure and the wage rate risks measure are highly correlated, but – though both are significantly correlated with the hours worked risks – for neither of the two are the correlations with hours worked risks all that high. On the other hand disability risks are negatively and significantly correlated with both the wages risks and wage rate risks, though the absolute magnitudes of these correlations are small and the correlation with hours worked risks is insignificant.

[Table 4 about here.]

4 Results

The primary results of interest for this study are estimates of associations between schooling attainment and wages, wage risks and disability risks. Therefore we estimate relations of the form of

$$Y_i = \alpha + \beta_i Z_i + \mu_i, \quad \mu \sim (0, \sigma^2) \quad (4)$$

Where Y_i is a seven-element vector of labor market outcomes (mean wages, mean wage rates, mean hours worked, wages risks, wage rate risks, hours worked risks, and disability risks) for each individual based on his/her being in one of the 144 labor market categories as a function of the vector Z , which includes three dichotomous variables for provinces (with Punjab the omitted category), a dichotomous variable for female, a dichotomous variable for rural and seven dichotomous variables for different schooling levels.

The first three variables in Y_i -- mean wages, mean wage rates, and mean hours worked – have been included because these are the work life-cycle equivalents of the variables that are the outcomes of usual emphasis in studies on associations between schooling and labor market outcomes. In addition we include various risks variables that have been defined and described above.

Table 5 presents estimates for the first three variables in Y_i . Ln mean wages are lower in Punjab than in the other three provinces, particularly than in Balochistan. This reflects that ln mean wage rates are higher in the three other provinces than in Punjab, indeed enough higher in Balochistan and in the North-West Frontier Province (NWFP) to more than offset the

significantly lower ln mean hours worked in these two provinces. The mean ln wages are 0.17 ln points lower in rural than in urban areas, primarily reflecting that the significantly lower ln wage rates are reinforced slightly by lower ln hours worked. The mean ln wages are 0.52 ln points lower for females than for males, reflecting a combination of 0.32 ln points lower ln wage rates and 0.20 lower ln points hours worked¹⁰. The coefficient estimates for the schooling levels indicate significant positive associations between schooling and ln wages and more strongly with ln wage rates. The latter more than offset the increasing significantly negative association between schooling levels and mean ln hours worked, perhaps because those with higher full incomes use part of their incomes to purchase more leisure. The patterns in the coefficient estimates for schooling attainment, thus, are consistent with the usual emphasis on positive associations of schooling with wages and wage rates, with the latter more than offsetting possibly negative associations with hours worked.

[Table 5 about here.]

Table 6 presents the estimates for the last four components of Y_i , those related to wages risks (including the two components of wage rate risks and hours worked risks) and disability risks. For almost all of the alternative risks variables, risks are significantly greater in the Punjab than in the other three provinces, and least of all in Balochistan.¹¹ The single exception to this statement is that the hours worked risks are greatest in the NWFP. The risks are significantly less in rural than in urban areas for wages, but are significantly greater in rural areas than in urban areas for wage rates, hours worked and disabilities. Thus in terms of geography, both with reference to provinces and rural/urban areas, there is a tendency *ceteris paribus* for lower wages to be associated with greater risks – the opposite of what one might expect if wages included compensating differentials for risks. Females experience significantly higher wages risks than males by about 0.16 ln points, reflecting primarily higher wage rate risks but also significantly higher hours worked risks. But females experience significantly lower disability risks.

[Table 6 about here.]

Of central interest for this paper are the associations between schooling and wages risks and disability risks, the estimated values of which are plotted in Figure 5. As compared with no schooling, having primary school does not significantly change the risk experience except for significantly slightly less hours worked risks. Having middle schooling, however, significantly reduces both wages risks (and both of its components) and disability risks. Having still higher levels of schooling increasingly reduces disability risks, but increases wages risks (and even more wage rate risks that offsets slight declines in hours worked risks). Therefore the increased

¹⁰ Khan and Irfan (1985), Shabbir (1993 and 1994) and Nasir (1999) present similar findings.

¹¹ Punjab is the largest province of Pakistan, both in terms of population and economic activity, with a large proportion of the workforce engaged in agriculture-based employment. During the period under study there were considerable fluctuations in agricultural production (Economic Survey of Pakistan 2006-07), consistent with relatively high risks in this province. Siddiqui and Siddiqui (1998) and Ashraf and Ashraf (1993) present related results for earning equations.

average wages and wage rates with more schooling noted in Table 5 may in part be due to compensating differentials for increased wages risks and wage rate risks – but there certainly is not evidence of compensating differentials for disability risks, which are negatively associated with schooling.

[Figure 5 here]

Figures 6 and 7 show how the mean return and risks estimates vary for male and female workers. Female workers are more exposed than male workers to disability risks and wage risks at the three lower levels of schooling and still have relatively low mean wages.

Table 7 presents alternative estimates in which the observations are the mean values for the subset of 106 of the 144 labor market categories for which there are sufficient numbers of observations (minimum number of observations in each category is at least 15), rather than the individuals, for the same specifications as in Tables 5 and 6. The estimates in Table 7 generally are consistent with the results in Tables 5 and 6 (i.e., positive associations of schooling with wages risks but negative association of schooling with disability risks), though with some minor differences and a tendency towards less precision.

5 Conclusion

Schooling is widely associated with wages in developing country labor markets. However other characteristics of these markets also may be importantly associated with schooling. Subject to the caveats about our assumptions above, we have examined what are the associations between schooling attainment and “wages risks” and “disability risks” in Pakistani labor markets. Our estimates suggest that more schooling is not only significantly positively associated with higher work life-cycle mean wages and wage rates, but also with higher wages risks and lower disability risks. These patterns also differ significantly by gender, moreover, with women with low schooling facing higher wages risks and lower disability risks than men with low schooling. Considering the wage level-schooling association alone, therefore, may be misleading regarding the associations of schooling with labor market outcomes and gender differentials in those associations.

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Table 1: Summary Statistics

Variables	Categories	Means/ (S.D)
Age (years)		33.8 (11.6)
Ln Monthly Wages		8.26 (.78)
Ln Hourly Wage Rates		2.95 (.85)
Hours Worked Per Week		49.4 (12.2)
Disability Risks		1.3 (11.9)
Male		89.6%
Rural		40.3%
Province	Punjab	44.3%
	Sind	28.2%
	NWFP	14.7%
	Balochistan	12.8%
Schooling	Illiterate	22.0%
	Primary (7 grades)	15.7%
	Middle (9 grades)	11.3%
	Matric (11 grades)	19.5%
	Intermediate (13 grades)	11.3%
	Graduation (15-16 grades)	13.4%
	Above Graduation (more than 16 grades)	6.8%
Occupations	Managers	6.4%
	Professionals	6.4%
	Technicians and Associate Professionals	19.1%
	Clerical Support workers	7.2%
	Service and Sales Workers	15.4%
	Skilled, Agricultural, Forestry and Fishery Workers	1.5%
	Craft and Related Trade Workers	14.5%
	Plant and Machine Operators, Assemblers	9.7%
	Elementary Occupations	19.5%
Total number of observations=		77685

Table 2. Regression Results for ln Monthly Wages, ln Hourly Wage Rate and ln Hours Worked per Week.

	ln Monthly Wages		ln Hourly Wage Rate		ln Hours Worked per Week	
Right-Side Variables	Coefficient Estimate	Standard Error	Coefficient Estimate	Standard Error	Coefficient Estimate	Standard Error
Age	0.14***	0.005	0.15***	0.006	-0.01***	0.002
Age ²	-0.001***	0.00007	-0.001***	0.00007	0.0001***	0.00002
<u>Occupation</u>						
Professionals	-0.34*	0.14	0.05	0.16	-0.39***	0.05
Technicians	-0.06	0.11	0.09	0.12	-0.15***	0.04
Clerks	1.42***	0.14	1.58***	0.15	-0.15**	0.05
Services	0.177	0.11	0.20	0.12	-0.02	0.04
Skilled_Agri	0.45*	0.19	0.55**	0.20	-0.10	0.07
Craft	0.66***	0.11	0.87***	0.12	-0.21***	0.04
Plant & Machine	1.54***	0.13	1.81***	0.13	-0.25***	0.04
Elementary/Unskilled	0.77***	0.11	0.83***	0.11	-0.06	0.04
<u>Occupations*Age</u>						
Professionals*Age	0.02*	0.008	0.003	0.008	0.01***	0.003
Technicians*Age	-0.02**	0.006	-0.01*	0.007	-0.0005	0.002
Clerks*Age	-0.09***	0.008	-0.09***	0.008	0.003	0.003
Services*Age	-0.03***	0.006	-0.04***	0.006	0.005**	0.002
Skilled_Agri*Age	-0.05***	0.010	-0.06***	0.01	0.005	0.003
Craft*age	-0.06***	0.006	-0.07***	0.006	0.011***	0.002
Plant & Machine*Age	-0.11***	0.007	-0.13***	0.007	0.02***	0.002
Elementary*Age	-0.07***	0.006	-0.08***	0.006	0.003	0.002
<u>Occupation*Age²</u>						
Professionals*Age ²	-0.0003**	0.0001	-0.0001	0.0001	-0.0001***	0.00003
Technicians*Age ²	0.0001*	0.0001	0.0001	0.00009	0.00003	0.00003
Clerks*Age ²	0.0009***	0.0001	0.001***	0.0001	-0.00001	0.00003
Services*Age ²	0.0002*	0.0001	0.0002*	0.00008	-0.00003	0.00003
Skilled_Agri*Age ²	0.0005***	0.0001	0.0005***	0.0001	-0.00005	0.00005
Craft*Age ²	0.0006***	0.0001	0.0007***	0.00008	-0.0001***	0.00003
Plant & Machine*Age ²	0.001***	0.0001	0.001***	0.00009	-0.0002***	0.00003
Elementary*Age ²	0.0007***	0.0001	0.0007***	0.00008	-3.65E-06	0.00002
<u>Region</u>						
Rural	0.006	0.04	0.007	0.04	0.0008	0.01
Rural*Age	-0.006*	0.002	-0.006*	0.002	-0.0002	0.0008
Rural*Age ²	0.00004	0.00003	0.00004	0.00003	3.64E-06	0.00001
<u>Gender</u>						
Female	-0.752***	0.06	-0.50***	0.07	-0.2***	0.02
Female*Age	0.022***	0.004	0.02***	0.004	0.005***	0.001

Female*Age²	-0.0003***	0.00005	-0.0002***	0.00006	-0.00007***	0.00002
<u>Province</u>						
Sind	0.045	0.045	0.02	0.05	0.02	0.02
NWFP	-0.032	0.062	-0.09	0.06	0.06*	0.02
Balochistan	0.41***	0.069	0.4***	0.07	-0.03	0.02
<u>Province*Age</u>						
Sind*Age	0.0026	0.0028	0.004	0.003	-0.001	0.001
NWFP*Age	0.0011	0.0035	0.007*	0.004	-0.006***	0.001
Balochistan*Age	-0.011*	0.004	-0.01*	0.005	-0.001	0.001
<u>Province*Age²</u>						
Sind*Age²	-0.00002	0.00003	-0.00004	0.00004	0.00002*	0.00001
NWFP*Age²	0.00001	0.00005	-0.00008	0.00005	0.00009***	0.00001
Balochistan*Age²	0.0001**	0.00005	0.0001	0.00006	0.00002	0.00002
Constant	5.87***	0.11	0.26***	0.11	4.16***	0.03
F(41, 77643)	1142.92		1215.54		491.51	
Prob > F	0.0000		0.0000		0.0000	
R-squared	.3764		.3909		.2061	
Adj R-squared	.3760		.3907		.2056	
N	77685		77685		77685	

Notes:

*t significant at p<.05

**t significant at p<.01

***t significant at p<.001

Table 3: Summary Statistics for Wages Risks, Wage Rate Risks, Hours Worked Risks and Disability Risks

Variable	Wages Risks	Wage Rate Risks	Hours Worked Risks	Disability Risks¹²
<u>Gender</u>				
Male	.57 (.09)	.63 (.09)	.22 (.04)	1.4 (12.3)
Female	.77 (.10)	.76 (.08)	.27 (.05)	.45 (7.05)
<u>Region</u>				
Rural	.58 (.09)	.65 (.08)	.23 (.04)	1.7 (14.8)
Urban	.60 (.12)	.65 (.11)	.22 (.04)	1.02 (9.3)
<u>Province</u>				
Punjab	.63 (.11)	.67 (.09)	.24 (.04)	1.6 (12.0)
Sind	.59 (.11)	.64 (.11)	.21 (.04)	1.17 (11.0)
NWFP	.58 (.11)	.64 (.10)	.26 (.04)	.96 (9.29)
Balochistan	.52 (.08)	.57 (.08)	.20 (.04)	0.93 (15.4)
<u>Schooling</u>				
Illiterate	.57 (.10)	.62 (.08)	.24 (.05)	1.78 (12.4)
Primary (5 grades)	.57 (.09)	.62 (.08)	.23 (.04)	2.12 (18.7)
Middle (8 grades)	.56 (.08)	.61 (.07)	.22 (.04)	1.56 (11.0)
Matric (10 grades)	.58 (.10)	.63 (.09)	.22 (.04)	.97 (8.96)
Intermediate (12 grades)	.59 (.11)	.64 (.11)	.22 (.04)	0.83 (10.4)
Graduation (14-16 grades)	.67 (.13)	.71 (.13)	.23 (.04)	0.63 (7.64)
Above Graduation (more than 16 grades)	.71 (.13)	.75 (.13)	.23 (.05)	0.45 (6.49)
<u>Occupations</u>				
Managers	.79 (.04)	.84 (.05)	.19 (.02)	0.69 (7.4)
Professionals	.82 (.06)	.87 (.06)	.26 (.04)	0.55 (7.44)
Technicians and Associate Professionals	.61 (.10)	.67 (.08)	.25 (.03)	0.63 (7.95)
Clerical Support Workers	.51	.55	.17	0.86

¹² The labor market disability risk rate is calculated as: number of injuries faced by every individual during one year/Total number of hours worked by every worker during one year*200,000; where 200,000 = base for 100 full-time equivalent workers (40 hours per week, 50 weeks per year.)

	(.05)	(.05)	(.03)	(11.29)
Service and Sales Workers	.56	.62	.22	.80
	(.05)	(.04)	(.02)	(8.27)
Skilled, Agricultural, Forestry & Fishery Workers	.52	.62	.23	2.55
	(.09)	(.07)	(.04)	(14.7)
Craft & Related Trade Workers	.58	.61	.19	2.44
	(.08)	(.06)	(.04)	(13.84)
Plant and Machine Operators, assemblers	.50	.56	.23	2.48
	(.03)	(.03)	(.02)	(20.13)
Elementary Occupations	.56	.63	.26	1.41
	(.08)	(.06)	(.03)	(12.68)
Number of observations=77685				

Table 4: Correlations among Wages Risks and Disability Risks

Type of Risk	Wages Risks	Wage Rate Risks	Hours Worked Risks	Disability Risks
Wages Risks	1	-	-	-
Wage Rate Risks	0.96* (0.00)	1	-	-
Hours Worked Risks	0.32* (0.00)	0.38* (0.00)	1	-
Disability Risks	-.025* (.00)	-.025* (0.00)	-.008 (.014)	1

Notes: *Significant at .01 level

Table 5: Regressions for Mean ln Wages, Mean ln Wage Rates and Mean ln Hours Worked

	Mean ln Wages		Mean ln Wage Rate		Mean ln Hours Worked	
	Coefficient Estimate	Standard Error	Coefficient Estimate	Standard Error	Coefficient Estimate	Standard Error
<u>Province</u>						
Sind	0.12***	0.002	0.12***	0.002	0.006***	0.0007
NWFP	0.06***	0.003	0.10***	0.003	-0.03***	0.0009
Balochistan	0.27***	0.003	0.34***	0.003	-0.06***	0.0009
<u>Region</u>						
Rural	-0.17***	0.002	-0.15***	0.002	-0.01***	0.0006
<u>Gender</u>						
Female	-0.52***	0.004	-0.32***	0.004	-0.20***	0.001
<u>Schooling</u>						
Primary	0.06***	0.003	0.07***	0.002	-0.005***	0.0009
Middle	0.10***	0.003	0.11***	0.004	-0.01***	0.001
Matriculation	0.25***	0.003	0.31***	0.003	-0.06***	0.0009
Intermediate	0.39***	0.003	0.51***	0.004	-0.11***	0.001
Degree	0.60***	0.004	0.74***	0.004	-0.13***	0.001
Above Degree	0.72***	0.005	0.87***	0.005	-0.14***	0.001
Constant	8.06***	0.002	2.65***	0.002	3.96***	0.0007
F(11, 77673)	7566.36		8579.84		8350.88	
Prob > F	0.0000		0.0000		0.0000	
Adj R-squared	0.56		0.53		0.54	
N	77685		77685		77685	

Table 6: Estimates of Associations of Schooling with Wages Risks and Disability Risks

	Wages Risks		Wage Rate Risks		Hours Worked Risks		Disability Risks	
	Coefficient Estimate	Standard Error	Coefficient Estimate	Standard Error	Coefficient Estimate	Standard Error	Coefficient Estimate	Standard Error
<u>Province</u>								
Sind	-0.03***	0.0007	-0.03***	0.0007	-0.02***	0.0003	-0.31***	0.10
NWFP	-0.04***	0.0009	-0.04***	0.0009	0.02***	0.0004	-0.57***	0.13
Balochistan	-0.09***	0.0009	-0.09***	0.001	-0.04***	0.0004	-0.73***	0.14
<u>Region</u>								
Rural	-0.0001*	0.0006	0.01***	0.0006	0.01***	0.0002	0.53***	0.09
<u>Gender</u>								
Female	0.16***	0.001	0.10***	0.0009	0.04***	0.0004	-0.81***	0.14
<u>Schooling</u>								
Primary	-0.0001	0.0008	-0.0007	0.0007	-0.009***	0.0004	0.27*	0.14
Middle	-0.003***	0.0009	-0.003***	0.001	-0.01***	0.0005	-0.28*	0.16
Matriculation	0.006***	0.0008	0.007***	0.001	-0.01***	0.0004	-0.77***	0.13
Intermediate	0.02***	0.001	0.02***	0.001	-0.01***	0.0005	-0.83***	0.16
Degree	0.09***	0.001	0.09***	0.001	-0.01***	0.0004	-0.96***	0.15
Above Degree	0.12***	0.001	0.12***	0.001	-0.01***	0.0006	-1.08***	0.19
Constant	0.58***	0.0007	0.64***	0.0007	0.24***	0.0003	1.88***	0.11
F(11, 77673)	5506.27		4190.13		3102.92		25.13	
Prob > F	0.0000		0.0000		0.0000		0.0000	
R-squared	0.4262		0.3330		0.3053		0.0035	
Adj.R-Squared	0.4261		0.3330		0.3053		0.0035	
N	77685		77685		77685		77685	

Table 7: Estimates of Association of Schooling with Mean ln Wage, Mean ln Wage Rate, Mean ln Hrs Worked, Mean ln Wage Risks), Mean ln Wage Rate Risks, Mean ln Hours Worked Risks, Mean Disability Risks [Note: Standard Errors in Parenthesis]

	Mean ln Wages	Mean ln Wage Rate	Mean ln Hrs Worked	Mean ln Wages Risks	Mean ln Wage Rate Risks	Mean ln Hours Worked Risks	Mean Disability Risks
<u>Province</u>							
Sind	0.14*** (0.05)	0.09** (0.05)	0.06** (0.02)	-0.04 (0.03)	-0.05** (0.03)	-0.03* (0.02)	-0.20 (0.32)
NWFP	0.04 (0.05)	0.04 (0.05)	0.0001 (0.02)	-0.07** (0.03)	-0.07*** (0.03)	0.01 (0.01)	-0.38 (0.30)
Balochistan	0.32*** (0.05)	0.33*** (0.05)	-0.01 (0.02)	-0.13*** (0.03)	-0.12*** (0.03)	-0.06*** (0.02)	-0.39 (0.32)
<u>Region</u>							
Rural	-0.10*** (0.04)	-0.08** (0.04)	-0.02 (0.02)	0.07** (0.02)	0.07*** (0.02)	0.02 (0.01)	0.69* (0.25)
<u>Gender</u>							
Female	-0.46*** (0.05)	-0.40*** (0.05)	-0.08*** (0.02)	0.12*** (0.03)	0.05* (0.03)	0.01 (0.02)	-0.49 (0.31)
<u>Schooling</u>							
Primary	-0.21 (0.43)	-0.16 (0.38)	-0.05 (0.19)	-0.35 (0.27)	-0.11 (0.24)	-0.28** (0.13)	-2.78 (2.65)
Middle	1.6** (0.61)	0.89 (0.55)	0.72** (0.26)	-0.24 (0.37)	-0.32 (0.34)	-0.17 (0.18)	6.35* (3.69)
Matric	0.22 (0.30)	0.18 (0.27)	0.04 (0.13)	0.13 (0.18)	0.14 (0.16)	-0.12 (0.09)	-2.36 (1.79)
Intermediate	0.65* (0.37)	0.92*** (0.32)	-0.28* (0.15)	-0.83*** (0.22)	-0.72*** (0.20)	-0.23** (0.11)	-1.63 (2.18)
Graduate	1.08*** (0.27)	1.14*** (0.23)	-0.07 (0.11)	0.39** (0.16)	0.48*** (0.14)	-0.06 (0.08)	-0.76 (1.58)
Above degree	2.21*** (0.21)	2.36*** (0.18)	-0.15 (0.09)	-0.08 (0.12)	-0.03 (0.11)	-0.19*** (0.06)	-0.76 (1.22)
Constant	7.17*** (0.09)	1.98*** (0.08)	3.84*** (0.05)	0.89*** (0.06)	0.83*** (0.05)	0.37*** (0.03)	1.81** (0.72)
N	106	106	106	106	106	106	106
F(11, 94)	69.30	103.65	15.55	11.29	9.60	6.34	3.84
Prob>F	0.00	0.00	0.00	0.00	0.00	0.00	0.00
R-Square	0.89	0.92	.645	0.56	0.52	0.43	0.31
Adj. R-Square	0.87	0.91	.603	0.51	0.47	0.36	0.23

Figure 1: Male- Female Life-Time Wage Earnings Profiles

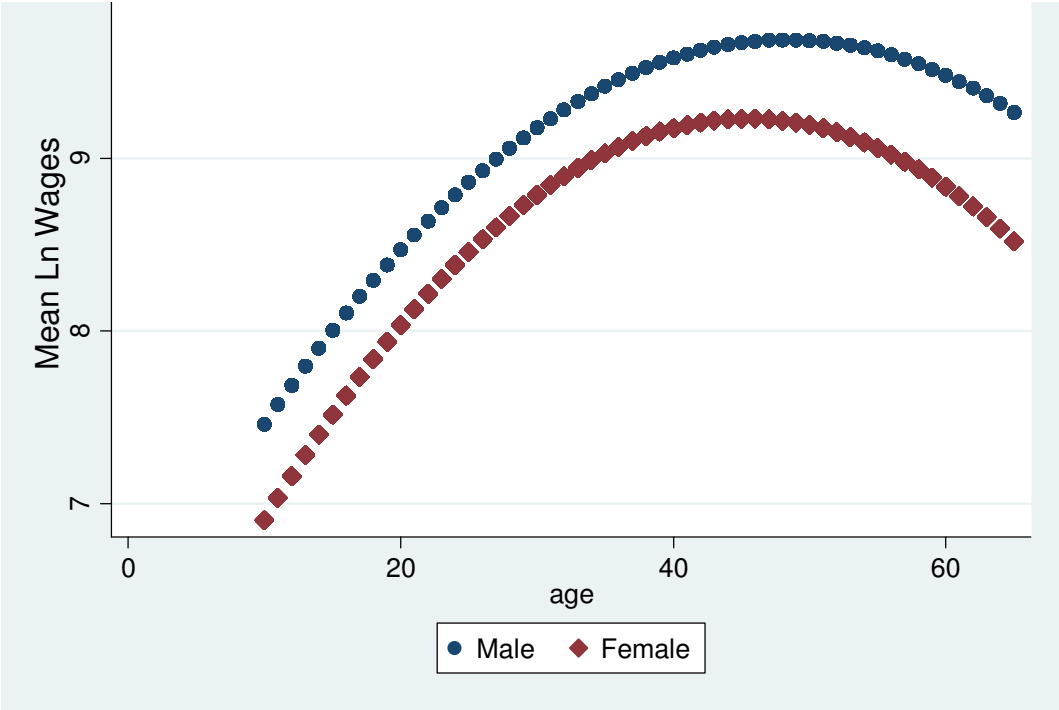


Figure 2. Urban-Rural Life Time Wage Earnings Profiles

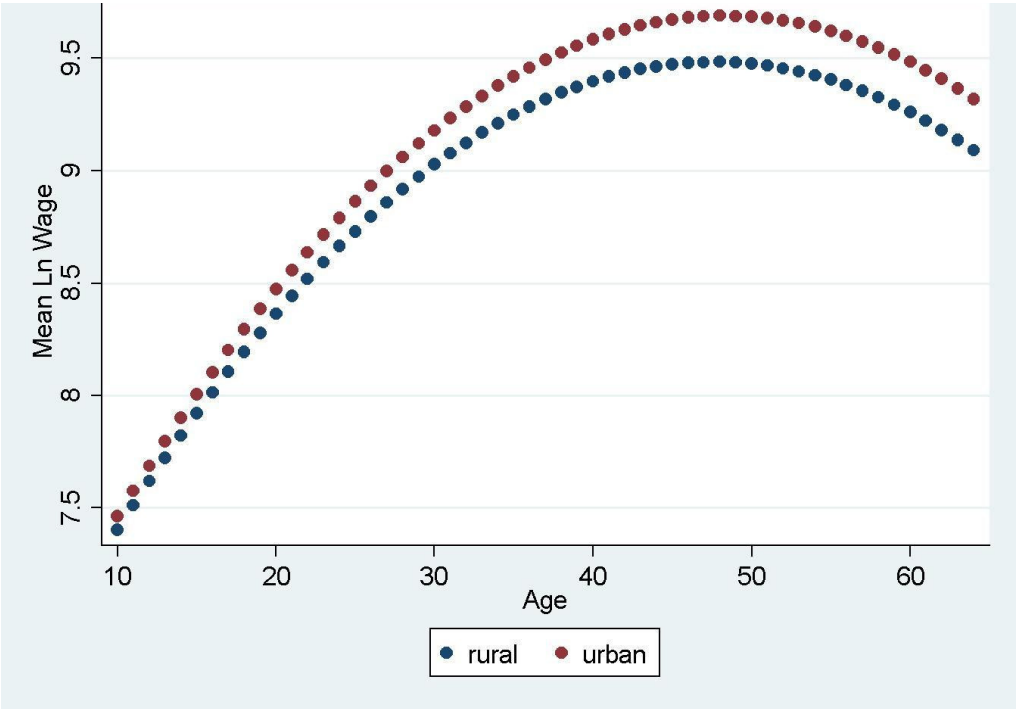


Figure 3. Life Time Wage Earnings Profiles in Different Provinces

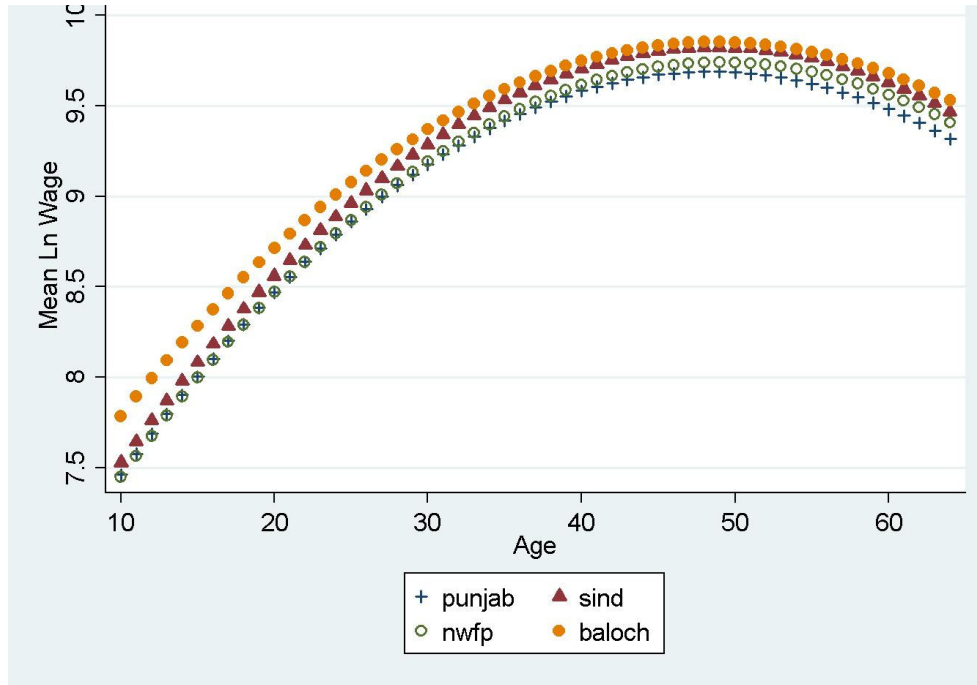


Figure 4. Life-Time Wage Earnings Profiles in Different Occupations

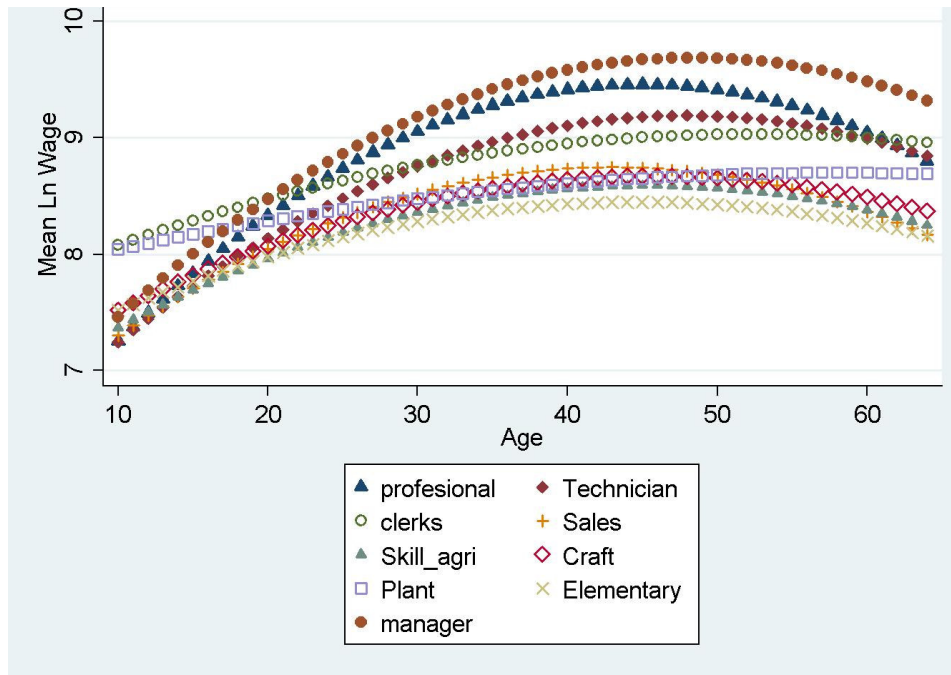


Figure 5: Schooling Levels and Associated Mean lnWages, Mean ln Wage Risks and Mean Disability Risks (Males and Females)

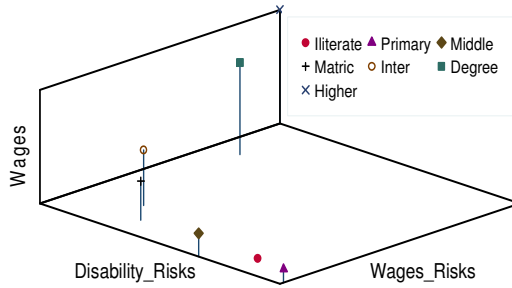


Figure 6: Schooling Levels and Associated Mean lnWages, Mean ln Wage Risks and Mean Disability Risks (Males Only)

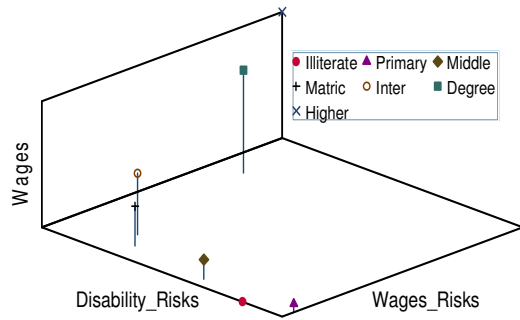


Figure 7: Schooling Levels and Associated Mean lnWages, Mean ln Wage Risks and Mean Disability Risks (Females Only)

