

Returns to Education in Agriculture and Financial Sectors of Punjab, Pakistan

Bedi-uz-Zaman¹ and Muhammad Imran²

<https://doi.org/10.62345/jads.2015.4.1.8>

Abstract

Education plays an elementary role in human capital formation and economic development of an economy. Mincerian earning function was estimated for the Punjab province and a comparative analysis was made between financial and agriculture sectors. The results showed that 8.4 percent increase in earnings per month was observed due to an additional year of education in financial sector whereas 7.5 percent increase in earnings per month was observed due to an additional year of education in agriculture sector. The results also showed that, returns to experience were higher in agriculture sector as compared to financial sector. The females earned approximately two times less than their male counterparts in financial sector. Male of agriculture sector earned three times more than their female counterparts. A remarkable positive impact of education and experience was observed on earnings in both sectors of the Punjab. The analysis showed that people engaged in financial sector earned higher wages as compared to agriculture sector.

Keywords: Human Capital, Agriculture Sector, Financial Sector, Earnings

Introduction

Education is an important component of human capital. The economics of education and especially the role of education in growth became prominent topic during the past decades (Shah 2007). Education plays a key role in human capital formation. It increases the productivity and efficiency of individuals and thus produces skilled labor force which is essential for sustainable economic development of the country (Nasir and Nazli 2000). Backer (1962) and Mincer (1974) showed the impact of education and role of training on person's life time earnings. In Mincerian equation of earnings, the coefficient of education indicates the returns to education i.e. how much an individual can get earnings with an additional year of education.

There exists an extensive range of literature that estimated the rates of returns to education for different countries like, Khan and Irfan (1985), Nasir (2002), Asadullah (2005), Awan and Hussain (2007), Shah (2007) and Pascharapoulos (1980; 1985; 1994 and 2004). The earlier studies focused at the macro level. The objective of this study was to investigate the contribution of education at sectoral level. In this study agriculture sector and financial sector were selected for analysis. The disaggregate level study seems more useful for policy makers in directing the education policy.

Nishat and Khalid (2008) estimated the earning function of business graduates in Pakistan. In sector wise analysis, they found that, return to education in banking sector was higher as compared to industrial sector. They also found that, well established and multinational companies paid higher wages as compared to national and less established companies. Dutta (2006) and Subbaraman and Witzke (2006) analyzed the returns to education between casual and regular workers of India. Both studies confirmed that, earnings of regular workers were higher as compared to earnings of casual workers. Hyder (2007)

¹ Assistant Professor, Department of Economics, University of Sargodha

² Graduate Student, Department of Economics, University of Sargodha



estimated the returns to education in public and private sectors of Pakistan. He found that, workers of public sector got higher wages as compared to workers of private sector.

Financial Sector

The role of financial sector can hardly be ignored in the economy. This sector provides not only better job opportunities to the community but also provides some valueable services. Banks play a major role in this sector. They provide monetary services to the people of the country.

Agriculture Sector

Agriculture sector is the backbone of Pakistan's economy. This sector not only provides food to the country's population but also supplies raw-material for the industries. The share of this sector in GDP was 22.4 percent in 2004-05, 22.5 percent in 2005-06, 21.8 percent in 2006-07 and 20.9 percent in 2007-08. Growth rate of this sector was 6.5 percent in 2004-05, 6.3 percent in 2005-06, 3.7 percent in 2006-07 and 21.5 percent in 2007-08 (Economic Survey of Pakistan 2006-07).

Materials and Methods

In order to estimate the returns to education Pakistan Social and Living Standard Measurement (PSLM) survey for the period of 2010-11 was used. The study was confined to Punjab province only. There were total 6682 households in the Punjab data set, of which 2790 belonged to urban while 3892 belonged to rural area. There were total 43379 individuals in the data.

The study imposed the following necessary restrictions on the required data set.

1. The individuals with age equal to or less than 10 years were excluded from the analysis.
2. Unpaid family workers and currently enrolled students were also excluded from the analysis, due to their non-participation in economic activities. The resultant data set was scaled down to 10681 observations and there were 129 observations of financial sector and 3151 observations of agriculture sector.

$$\ln W = \alpha + \beta_1 \text{Edu} + \beta_2 \text{Exp} + \beta_3 \text{Expsq} + \beta_4 \text{Male} + \beta_5 \text{Urban} + u \dots \dots \dots (1)$$

Where:

- Lnw = Natural log of monthly wages
- Edu = years of education
- Exp = Experience (Age-years of education -6)
- Expsq = Experience square
- Gender = dummy variable (if, male=1, others=0)
- Urban = dummy variable (if, urban= 1, others = 0)

u: error term; and α and β 's are the parameters to be estimated by the equation.

The model in equation 1 was used to analyze the returns to education in the Punjab for both financial and agriculture sectors.

In this study, primary data PSLM (2010-11) were used, which were collected by Federal Bureau of Statistics. There was a problem of heteroskedasticity in the given data. To check the heteroskedasticity White Test was applied.

$$nR^2 > \chi^2_{(k-1),\alpha} \dots \dots \dots (2)$$

Then there was a presence of heteroskedasticity i.e. violation of OLS assumption (constant variance) in the data set. This was removed by "White test" which was more appropriate as compared to others.

Results and Discussion

In this study, a diversified analysis of returns to education and basic Mincerian Earning function was obtained. Regarding analysis of returns to education in financial sector, the results were reported in Table 1.1.

Table 1.1: OLS Estimates of Mincerian Earning Function in the Punjab Financial Sector

(Dependent = lnw)		
Variable	Coefficient	t-value
Constant	7.286***	13.851
Edu	0.084***	4.912
Exp	0.070***	3.984
Expsq	-0.0009***	-2.445
Gender	0.238	0.537
Urban	0.014	0.081
R ²		0.27
Adj R ²		0.24
N		129

*** Shows that coefficient is significantly different from zero at 0.01 percent probability level

The coefficient of education showed that, one extra year of education resulted in an increase of 8.4 percent monthly earnings. The results revealed that, a person with one year of experience earned 7.0 percent higher earnings as compared to non-experienced person. In financial sector there was a minor difference of education's return among male and female. Male earned only 0.24 time's more wages than their female counterpart. The analysis for financial sector at rural and urban levels illustrated that people living in urban areas received only 1.4 percent higher wages than people of rural areas. In comparative analysis of returns to education and experience in financial sector, it was analyzed that education's returns were 1.2 percent higher than that of experience. Education (edu), experience (exp) and experience square (expsq) coefficients were significant at 0.01 percent probability level. These results are in line with those of Shabbir (1994) and Khan and Irfan (1985). The coefficients urban and gender (male) were insignificant. These results are also consistent with those of Nishat and Khalid (2006).

A return to education in agriculture sector was reported in Table 1.2. The coefficient of education showed that an additional year of education resulted in an increase of 7.5 percent monthly earnings. The coefficient of experience was 10.7 percent which on one extra year of experience increased monthly earnings by 10.7 percent.

Table 1.2: OLS Estimates of Mincerian Earning Function in the Punjab (Agriculture Sector)
(Dependent = $\ln w$)

Variable	Coefficient	t-value
Constant	3.983***	46.809
Edu	0.075***	14.832
Exp	0.107***	21.719
Expsq	-0.001***	-15.424
Gender	3.039***	57.554
Urban	0.038	0.475
R ²		0.63
Adj R ²		0.63
N		3151

*** Shows that coefficient is significantly different from zero at 0.01 percent probability level

Regarding returns to education analysis, it was reported in Table 1.2 that people of agriculture sector got 2.1 percent higher earnings due to one extra year of experience as compared to education. Male earned 3.0 times more than their female counterparts. In rural-urban comparison, it was found that people living in urban areas enjoyed 3.8 percent higher wages than people of rural areas. These results are in line with findings of Ashraf and Ashraf (1993) and Dutta (2006).

Regarding overall analysis of returns to education, the results were reported in Table 1.3. The coefficient of education showed that, one additional year of education resulted in an increase of 9.1 percent in monthly earnings. The coefficient of experience showed that, one extra year of experience increased monthly earnings by 6.9 percent.

Males earned 2 times more than females. In rural-urban comparison for Punjab, it was found that people living in urban areas enjoyed 17 percent higher wages than people of rural areas. These results are in line with those of Awan and Hussain (2007) and Nasir and Nazli (2000). The coefficients of education (edu), experience (exp) and gender were positive and consistent with economic theory. The experience square (expsq) was negative which explained the concavity of the Mincerian earning function.

Table 1.3: OLS Estimates of Mincerian Earning Function in the Punjab (Overall)
(Dependent = $\ln w$)

Variable	Coefficient	t-value
Constant	4.949***	122.792
Edu	0.091***	37.450
Exp	0.069***	28.852
Expsq	-0.0006***	-16.551
Gender	2.119***	71.752
Urban	0.170***	7.930
R ²		0.52
Adj R ²		0.52
N		10681

*** Shows that coefficient is significantly different from zero at 0.01 percent probability level

In comparative analysis of returns to education and experience, it was found that education's return was 1.6 percent higher than that of experience. All the coefficients were significant at 0.01 percent probability level.

The separate analysis of returns to education for both males and females was also performed. The results in Table 1.4 explained the behavior of returns to education for males only. The results given in Table 1.4 revealed that one extra year of education raised 6.5 percent monthly earnings; moreover, an extra year of experience resulted in 7.7 percent increase in earnings.

Table 1.4: OLS Estimates of Mincerian Earning Function in the Punjab (Male)
(Dependent = $\ln w$)

Variable	Coefficient	t-value
Constant	7.020***	173.313
Edu	0.065***	27.205
Exp	0.077***	29.393
Expsq	-0.0007***	-17.580
R ²	0.22	
Adj R ²	0.22	
N	8432	

*** Shows that coefficient is significantly different from zero at 0.01 percent probability level

The results in Table 1.5 explained the behavior of returns to education for females only, which showed that one extra year of education, raised 17.8 percent monthly earnings. The coefficient of experience showed that an extra year of experience increased monthly earnings by 7.1 percent. In separate analysis of returns to education, it was found that females enjoyed higher returns to education (17.8 percent) than their male counterparts. All the coefficients were significant at 0.01 percent probability level.

Table 1.5: OLS Estimates of Mincerian Earning Function in the Punjab (Female)
(Dependent = $\ln w$)

Variable	Coefficient	t-value
Constant	4.737***	59.405
Edu	0.178***	32.695
Exp	0.071***	11.938
Expsq	-0.0008***	-7.702
R ²	0.33	
Adj R ²	0.33	
N	2249	

*** Shows that coefficient is significantly different from zero at 0.01 percent probability level

In the light of above results, it was found that returns to education were lower in agriculture sector as compared to financial sector. Return to experience was higher in agriculture sector (10.7 percent) as compared financial sector.

In separate analysis of returns to education among males and females it was found that females got 17.8 percent returns to education whereas males got only 6.5 percent returns to education. Returns to experience were higher in males (7.7 percent) as compared to females (7.1percent).

Conclusion and Recommendations

The study has established the significant, effective and positive role of educations in earnings. The study found that an additional year of schooling resulted in an increase of 9.1 percent in monthly earnings and one extra year of experience increased 6.9 percent in monthly earnings in the Punjab. The study also analyzed the comparison of earnings among males and females. The males earned two times higher wages than females because of their higher participation in the labor market as compared to females. Due to better availability of education and other facilities in urban areas, people earned higher wages in urban areas as compared to people of rural areas. The results showed that people of urban areas earned 17 percent higher monthly wages than people of rural areas. The concavity of Mincerian earning function was also proved by using experience square terms and results were significant and according to economic theory. In separate analysis of returns to education among genders, females earned higher education returns as compared to males. In sector wise analysis of returns to education the study found that returns to education in financial sector were higher as compared to manufacturing and agriculture sector. People working in financial sector earned not only higher wages but also availed better facilities as compared to manufacturing and agriculture sectors. Males in agriculture sector earned higher wages as compared to males of financial sector. Returns to experience were higher in agriculture sector as compared to financial sector.

Agriculture sector is one of the biggest sectors of Pakistan's economy. This sector not only supplies raw material to the industrial sector but also provides food stuff to the community. Returns to education were lower in agriculture sector as compared to financial sectors. So, government should try to establish training centers institutes for those people who are related to agriculture sector to create awareness about advanced technologies. Government should try to establish the agriculture research department which provides latest literature to the agriculturist (Kissan) community.

References

- Amin, A. A. and Awung, W. J.(2005), "Economic Analysis of Private Returns to Investment in Education in Cameroon", African Institute for Economic Development and Planning (IDEP) B.P.3186 CP 18524.
- Asadullah, M. N. (2005), "Returns to education in Bangladesh", *QEH Working Paper Series – QEHWPS130*
- Ashraf, J. and Ashraf, B. (1993), "An Analysis of the Male-Female Earning Differential in Pakistan", *The Pakistan Development Review* Volume 32(4)
- Awan, M. S. and Hussain Z. (2007), "Returns to Education and Gender Differentials in Wages in Pakistan", *The Lahore Journal of Economics* Volume 12:2
- Boheim, et.al (2005), "Wage Differences Between Men and Women in Austria: Evidence from 1983 and 1997", *Discussion paper series, IZA DP No. 155*
- Chalamwong, Y. and Amornthum, S. (2001), "Rate of Return to Education", *Thailand Development Research Institute (TDRI)*
- Coleman, J.S. (1998), "The effect of tenure on earnings for males: a public/private analysis", *Applied Economics Letters*, Vol 5. 707± 710

- Danh, N. and Long, H. (2008), “Public-private sector wage differentials for males and females in Vietnam”, MPRA Paper No.6583
- Dhesi, A.(2002), “Expected Life-earnings Paths with and without Higher Education: the case of India”, *International Review of Applied Economics*, Vol.16, No.4
- Duraisamy, P. (2000), “Changes in Returns to Education in India 1983-94: By Gender, Age-Cohort and Location”, Center Discussion Paper No. 815, Economic Growth Center, Yale University, New Haven, Connecticut
- Dutta, P.V.(2006), “Returns to Education: New Evidence for India, 1983–1999”, *Education Economics* Vol. 14, No. 4, 431–451,
- Glinskaya, E. and Lokshin M. (2005), “Wage Differential between the Public and Private Sector in India”, World Bank Policy Research Working Paper 3574.
- Gujarati, D.N. (2005), *Basic Econometrics*. (4th edition). New York: MacGraw-Hill, Inc.
- Haque, N. (1977), “An Economic Analysis of Personal Earnings in Rawalpindi City”, *The Pakistan Development Review* 16:4
- Hyder, A. (2007), “Wage Differentials, Rate of Return to Education, and Occupational Wage Share in the Labour Market of Pakistan”, <http://mpa.ub.uni-muenchen.de/2224/> MPRA Paper No. 2224, posted 07.
- Jovanovic. B. and Lokshin, M. M. (2004), “ Wage Differential Between The State and Private Sector in Moscow”, *Review of Income and Wealth* series 50, No.1
- Kapsos, S. (2008), “The gender wage gap in Bangladesh”, ILO Asia-Pacific working paper series”
- Khan, F.S. and Toor, I. A. (2003), “Changes in Returns to Education in Pakistan: 1990-2002”, *The Lahore Journal of Economics* Volume 8, No.2
- Khan S.R. and Irfan, M. (1985), “Rate of Return to Education and Determinants of Earnings in Pakistan”, *The Pakistan Development Review*, 34:3 and 4
- Nasir, Z. M. (2000), “Earning differential between public and private sectors in Pakistan”, *The Pakistan Development review* 39:2 111-130
- Nasir, Z. M. and Mehmood, R. (1998), “Pesonal Earnings Inequality in Pakistan: Findings from the HIES 1993-94”, *The Pakistan Development Review* Volume 37:1
- Nasir, Z.M. and Nazli, H. (2000), “Education and Earnings in Pakistan”, Pakistan Institute of Development Economics, (Research Report No 177)
- Shabbir, T. (1994), “Mincerian Earnings Function for Pakistan”. *The Pakistan Development Review* Volume 33 (1)
- Shah, R.(2007), “Impact of Higher Education on Earnings of Women in the Public Sector Educational Institutions in Pakistan”, *International Business & Economics Research Journal* Vol 6, No 11.
- Siddiqui, R. and Siddiqui, R. (1998), “A Decomposition of male-Female Earnings Differentials”, *The Pakistan Development Review* Volume 37:4
- Tensel, A. (1999), “Public-Private Employment Choice, Wage Differentials And Gender in Turkey”, Center Discussion Paper No.797
- Wright, R. E. (1999). “The Rate of Return to Private Schooling”, IZA Discussion Paper No. 92
- Nishat, M. and Khalid, S.M. A. (2006), “Earning Function of Business Graduates in Pakistan”, Annual Conference on Management and Practice (AMDIP) ,Islamabad pakistan. <http://ssrn.com/abstract=959527>
- Psacharopoulos, G. and Partrinos, H. A. (2002), “Returns to Investment in Education: A Further Update” World Bank Policy Research Paper 2881, September, World Bank, Washington.