Earnings Effect of Education in Nagaland

N. Janbemo Humtsoe[*] and B. Kilangla Jamir

Research Scholar, Department of Economics, Nagaland University. Lumami, Zunheboto, Nagaland. India 798627

ABSTRACT

This paper attempts to study the impact of education on earnings in the state of Nagaland in India. The returns to education are derived through the Mincerian earnings function. The study found positive relation between years of schooling and income. Overall, income increases by 5.5 percent for each year increase in schooling. The rate of return to schooling is found to be highest for primary education at 17.2 percent, while that of secondary and higher education are found to be 6 and 7.5 percent respectively. Females have higher rate of return at 6.9 percent as compared to males at 2.8 percent. Similarly, urban workers have higher returns to schooling at 5.7 percent comparing to rural workers at 4.8 percent.

Keywords: Human Capital, Education, Earnings, Returns to Education, Labor

The positive correlation between education and income is one of the most popular and well established relationships in social sciences. According to the human capital theory, individuals invest in education as it enhances ones skills and competencies which lead to better employment opportunities, higher earnings and more interesting and varied careers. These skills or human capital are normally acquired through formal schoolings or work experience, which in turn increase the individual's value to the employer and therefore their future earnings (Riddell, 2006).

The amount and level of education acquired by workers critically affects their labour market outcomes. The higher the level of education an individual acquire, the better they are able to absorb new information, learn new skills and familiarize with new technologies. By increasing their human capital, workers enhance their own productivity as well as the productivity of other physical capital (Poteliene and Tamasauskiene, 2013). In similar vein, Lucas (1998) believed that the higher the level of education of the work force, higher the overall productivity of capital because the more educated are likely to innovate, and thus affect everyone's productivity.

Numerous studies have confirmed that better educated individuals earn higher wages, experience lesser unemployment and work in more desirable occupations. In addition to these tangible effects of education, there are benefits in numerous areas such as health and hygiene, manners, discipline, civic sense

Address for correspondence

Department of Economics, Nagaland University. Lumami, Zunheboto, Nagaland, India

E-mail: janbemolotha@gmail.com

and political participation etc. that affects individual and societal wellbeing. According to Oreopoulos and Salvanes, (2009), education helps individuals make better decisions about health, marriage, and parenting. It also improves patience, making individuals more goal-oriented and less likely to engage in risky behavior. Study also shows that Individuals invest in education for their own benefit but their investment increases the general level of knowledge in the society which, in turn, facilitates the accumulation of knowledge by others. Thus, education is fundamental in enhancing the quality of human life and ensuring social and economic progress, with significant positive spillover effect in the Society (UN, 1997)

Returns to Education

Economists regard education as both consumer and capital good as it offers utility to a consumer and also serves as an input into the production of other goods and services (Olaniyan and Okemakinde, 2008). Returns to investment in education have been estimated since the late 1950s; and throughout these periods, the economic value of investment in education has been mostly measured by its rate of return because it provides a fundamental analytical tool to evaluate the educational investment that is the biggest and most important component of the human capital (Poteliene and Tamasauskiene, 2013). Becker (1993) was also of the opinion that the rates of return provide the most convenient and complete summary of the economic effects of education.

The positive effect that education had on earnings and employment is being supported by scores of empirical evidence. McMohan (1999) in a study of both static and dynamic impact of education on economic growth found the private returns to education for US and UK to be 11 and 13 percent respectively. Oreopoulos & Salvanes, (2009) also found that the monetary returns to annual adult income from spending one year in high school or college are about 7 to 12 percent. The study further indicated that returns are generally higher among individuals from more disadvantaged backgrounds.

Bhandari & Bordoloi, (2006) in a study in India find the returns to primary, middle, high school, higher

secondary, graduation, professional degree, and post graduate degree to be 6.2, 4.8, 12.8, 9.4, 15.5, 27.3 and 26.9 percent respectively suggesting a higher rate of returns for those who have completed higher levels of education. Furthermore, returns to education are also found to be relatively higher for professional degrees and post graduations. Duraisamy (2000) also found that private returns per year of schooling in India in 1993-94 for the primary, middle, secondary, higher secondary and college levels of education are found to be 7.9, 7.4, 17.3, 9.3 and 11.7 percent respectively.

Similarly, Harberger & Guillermo, (2012), in a study on private returns to education in Mexico, found a sharp increase in rates of return and net present values as one moves up the educational ladder. The study found that the median rate of return for males increases from 2.13 percent to 5.86 percent to 11.26 percent to 14.27 percent as one moves up from middle school to high school to college and to post graduation. The corresponding figures for women are 5.49 percent, 7.26 percent, 10.36 percent and 14.39 percent.

However, Psacharopoulos (1972) in a cross country analysis found the private rate of return for education to be 24.1 percent for primary education, 17 and 17.5 percent for secondary and higher education. A contrast to the popular opinion that the higher education yields the highest return. The higher rate of return for primary education, according to Psacharopoulos, is because foregone earnings for primary pupils are nil or much lower than older pupils. He also attributed the declining rate of return as one climb up the ladder of education to the 'law of diminishing returns', adding that, successive increments of one factor yield even lower returns at the margin.

On average, returns to education are found to be higher in the low income countries, a reflection of the relative scarcity of human capital in poor countries (Psacharopoulos, 2006). However, results are not uniform and some studies have shown low rate of return in developing countries, such as, 7.1 percent for Bangladesh (Asadullah, 2005), 5.1 percent for Pakistan (Afzal, 2011), 7 percent for Sri Lanka and Indonesia, 4.8 percent for Vietnam and 5.4 percent for Estonia (Psacharopoulos & Patrinos, 2004). Justifying for these

low correlations, Mincer (1975) explained that, since schooling is not the only type of investment in human capital, the gross relation between schooling and earnings does not adequately represent the human capital earnings function.

Returns to education are also found to be higher for females, though men earn more than women in absolute terms. Psacharopoulos and Patrinos (2004) in global comparisons find a higher rate of return for women at 9.8 percent comparing to men at 8.7 percent. Trostel *et al* (2002) in a study of 28 countries also found the rate of return to schooling to be 4.8 percent for men and 5.7 percent for women. Sweetman (1999) in a related study also found the additional years of schooling to be 14.6 percent for females and 10.8 percent for males. The higher rate of return for women has been attributed to the lower opportunity cost of women's education (Psacharopoulos, 2006).

Study Area

Nagaland became the 16th State of India in 1963. The state is divided into eleven districts namely, Dimapur, Kiphire, Kohima, Longleng, Mokokchung, Mon, Peren, Phek, Tuensang, Wokha and Zunheboto. It has an area of 16,579 square kilometers and borders the state of Assam in the west, Arunachal Pradesh and part of Assam in the north, Manipur in the south and Myanmar in the east. Nagaland is predominantly rural, where 71.14 percent of its 1.9 million populations live in the rural areas, and 28.85 percent live in the urban areas (Census of India 2011). The state has a sex ratio of 931 and the density of population is 119 per square kilometers. The work participation rate in the state increased from 42.6 in 2001 to 49.2 percent in 2011. Nagaland's literacy rate had also increased from 17.91 percent in 1961 to 80.11 percent in 2011 with the male literacy at 83.29 percent and female literacy at 76.69 percent. The urban literacy rate stood higher at 89.6 percent against the rural literacy rate of 75.3 percent.

Objectives

❐ To estimate the age- earnings profiles by level of education.

❐ To derive the earning functions by level of education, gender and region.

Database

The study relied on primary data as secondary data were not available for the state of Nagaland. Wokha district has been chosen as the sample district and data were collected through direct personal interviews between October 2013 and March 2014. Three villages were randomly selected wherein ten (10) percent of the household from each village, totaling 80 households constituted the sample units for the rural areas. For the urban areas, Wokha town was selected wherein twenty (20) household from five different municipal blocks/colony, with a total of 100 households, are selected at random as sample units, which fairly represents the diverse socio-economic characteristics of the study area.

Methodology

The Mincerian human capital earnings function is one of the most widely used empirical equations in labor economics. The study, therefore, used the Mincer equation which involves the fitting of the natural logarithm of earnings as the dependent variable, and years of schooling, potential work experience and its square as independent variables.

$$\ln Y = a + bS + cX + dX^2 + e \qquad (1)$$

Where S represents years of schooling, X represents the years of potential work experience, and e is a statistical residual. In the absence of direct information on job experience, Mincer used the potential experience which is the number of years an individual of age A could have worked, assuming he started school at age 6, finished S years of schooling in exactly S years, and began working immediately thereafter (Card, 1999). Therefore, potential work experience (X) = A – S - 6.

However, if we assume the minimum age for joining the workforce to be 15 years, the above potential work experience function gives misleading results, as every worker does not necessarily stay enrolled in the school till 15 years of age. Aslam (2007) also encountered similar problem for Pakistan. If for instance, we are to find out the potential work experience for a 20 year old

worker who spend only two years in school, the above potential work experience function would give X = 20 - 2 - 6 = 12 years' experience. This cannot be true because a person does not normally enter into the workforce by 8 years of age.

Therefore, for the sake of simplicity, for workers who gave up schooling before attaining 15 years, the potential experience is derived as (X) = A – 15. Moreover, as the years of schooling for this paper has been counted from preprimary level, and the average years of preprimary pupils are 4 years, the experience function used here is (X) = A – S – 4.

The coefficient on the years of schooling or the 'b' in equation (1) is normally considered to be the rate of return on education even though there are disputes between some economists on this issue. According to Psacharopoulos (1994), the coefficient on years of schooling can be interpreted as the average private rate of return to one additional year of education. Card (1999) also agreed that, assuming that each additional year of schooling has the same proportional effect on earnings, the coefficient 'b' in equation (1) completely summarizes the effect of education in the labor market. Therefore, the study also used the conventional method to refer 'b' as the returns to education.

The study, however, found the coefficient for the experience square (X^2) in equation (1) to be statistically insignificant in all the analysis, therefore X^2 is dropped from the analysis. As such, the adjusted earning function is:

In Y = a + bS + cX + e   (2)

Results and Discussion

Age-Earnings Profile by Level of Education

The age-earning profile for the whole sample depicted in figure 1 is derived from Table A1. It shows that earnings increases with increase in educational attainments. The mean income is lowest for illiterates, while it is highest for workers with postgraduate degree.
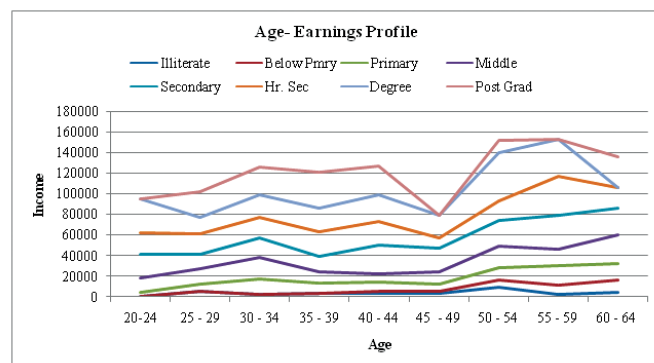

Fig. 1: Age- Earnings Profile by level of education, Wokha, 2013-14

Source: Calculations from Table A1

Income tends to fall after reaching retirement period for those having higher secondary education and above, indicating the fall in income after retirement as majority of the educated workers are employed in the organized or public sector where the retirement age in Nagaland is currently 57 years. However, the income for workers with secondary education and below shows a stable or steady growth even after 60 years signaling a longer working period for the less educated workers.

Mean Income by Economic Sector, Region, Gender and Education

Mean monthly income is highest for workers in public sector where an employee earns twice the income earned by an employee in the private sector, which could be the reason for huge societal preferences for employment in government sector. However, higher wages in the public sector is still an issue of debate as public sector wages typically do not reflect market wages (Psacharopoulos & Patrinos, 2004). On the other hand, the low average income in the private sector could be due to underdevelopment of vital economic sectors and low investment and economic activity in the private sector.

The average monthly income is higher in urban than rural area in both public (17.17 %) and private sectors (37.78%), showing a relatively higher income inequality in the private sector. Correspondingly, the income gap between urban and rural areas is found to be lower

amongst male workers (20.70 percent) than female workers (57.48 percent), indicating higher income differentials amongst female workers. The gender gap in earnings is also higher within the rural area, where earnings of male average are higher than females by 51 percent. Overall, Urban workers earns more than the rural workers by at least 30 percent, while male workers earns 35 percent higher than female workers.

Table 1: Mean Monthly Income by economic sector, gender and region (*in ₹)

Average Income	Rural	Urban	Income Gap (In %)	Total
Public Sector	24,509	29,591	17.17	25,223
Private Sector	9,125	14,666	37.78	12,675
Male Average	17,556	22,139	20.70	20,942
Female Average	8,512	20,021	57.48	13,467
Total Sample	14,931	21,408	30.25	18,065

Source: Field Survey, 2013-14.

The mean income for female remains low comparing to male counterparts at all levels of education except higher secondary and post graduations. However, the gender gap in income tends to fall as one climbs the ladder of education.

Table 2: Mean Monthly Income by Education and Gender (*in ₹)

Levels of Education	Female	Male	Income gap (In %)	Total
Illiterate	3,181	4,833	34.18	3,435
Below primary	3,600	15,631	76.96	11,482
Primary	6,576	17,353	62.10	13,388
Middle	8,300	20,157	58.82	15,931
Secondary	16,043	21,209	24.35	20,635
Hr. Secondary	23,481	22,275	- 5.13	22,839
Degree	20,565	22,694	9.38	22,000
Post Graduate	28,000	27,857	- 0.51	27,925
Total	13,467	20,942	35.69	18,065

Source: Field Survey, 2013-14.

Moreover, higher secondary and post graduate female workers earns more than males by 5.13 and 0.5 percent, showing the strong effects of education in offsetting income differences and in maintaining income parity between workers or gender.

Regressions Estimates

The results for the rate of returns on education is presented in table (3) where the logarithm of earnings is taken as the dependent variable and the years of schooling and experience as the independent variables. The result of the analysis shows the returns to schooling to be 5.5 percent indicating an increase in income by 5.5 percent for each year increase in schooling. The returns to an additional year of work experience are found to be only 1.5 percent showing weaker effects of work experience on earnings.

Table 3: Regression Estimates of Earnings Function

Variables	Years of Schooling	Work Experience
Male	.028 ***	.011 ***
	(.000)	(.000)
Female	.069 ***	.013 ***
	(.000)	(.012)
Rural	.048 ***	.003
	(.000)	(.612)
Urban	.057 ***	.027 ***
	(.000)	(.000)
Primary Education	.172 ***	.091
	(.006)	(.071)
Secondary Education	.060 ***	-.002
	(.000)	(.705)
Higher Education	.075 ***	.015
	(.002)	(.096)
Total sample	.055 ***	.015 ***
(N=562)	(.000)	(.000)

Figures in parenthesis represent the P values.
*** *Significant at 1 per cent.*

Gender and Region

The returns to years of schooling are found to be higher for females at 6.9 percent comparing to male at 2.8 percent. The weak income base for females, comparing to males, could be the primary factor for the high returns, as income for female is found to have increased sharply with increase in educational attainments. Moreover, income differentials between the educated and less educated workers are also found to be higher for female, showing that lesser educated females earns significantly lower income and vice versa. Urban workers have higher returns to education at 5.7 percent comparing to rural workers at 4.8 percent.
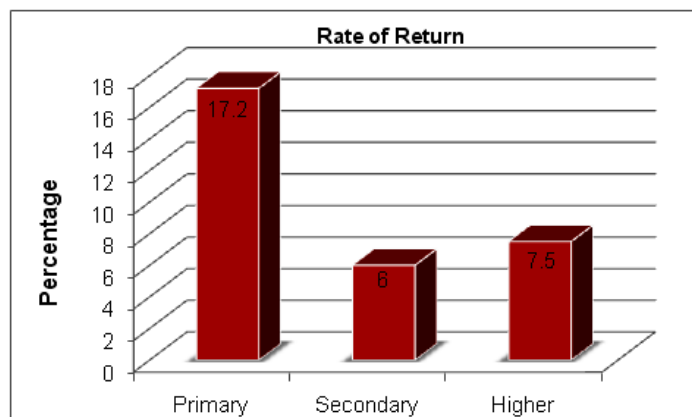

Fig. 2: Rate of Return for Primary, Secondary and Higher Education

Source: Based on Table 3.

Education

For the analysis, the levels of education were classified into three broad categories namely, primary, secondary and higher education. Among these educational groups, the primary education has the highest rate at 17.2 percent, while that of secondary and higher education are found to be 6 and 7.5 percents, respectively. Psacharopoulos (1972) also observed similar results and he attributed the outcome to low forgone earnings for primary education and the application of the law of diminishing returns. Agrawal (2012) also agreed that this is due to the low cost of primary education relative to other levels of education and considerable productivity differentials

between primary graduates and illiterate persons. This study found that the average monthly income for illiterates was a meager ₹ 3435 comparing to ₹ 13388 for the primary workers.

Therefore, the weak income base of the illiterate workers could have resulted in higher rate of returns for the primary education, and that being able to read and write and solve basic numeracy pays huge dividends comparing to those who cannot.

Another plausible explanation for the low rate of return for higher education could be due to generalization of the stream of education leading to possible qualification and skills mismatch in the labor market. Among those who pursued higher education, 79.6 percent are found to have studied arts education, while the percentage for science, commerce, technical, vocational and other professional course combined is just 20 percent. Regression analysis between arts and non-arts educated workers using dummy variables shows that non-arts educated workers earns more than the arts educated workers by as much as 12.4 percent.

Therefore, it can be deduced that if societal preference for arts education can be altered in favor of non-arts education, preferably technical and vocational degrees, the rate of return for higher education could increase significantly.

The point is not to argue that arts education is not desirable; but the oversupply of workers with a particular type of educational degree has its effect on the outcomes of the labour market. Yamada (2015) argued that job-education mismatches may arise if a large share of university graduates fall short of the quality standards and skills demanded by the labour market leading to underemployment and unemployment. Therefore, when there is an oversupply of similarly skilled workforce, say arts graduates, an automatic interplay amongst them would result in lower wage rate and higher unemployment within the group. On the other hand, relative scarcity of math and other technical and professional graduates would create a supply constraint for such specialized labour leading to imbalances in the labour market.

Table 4: List of higher educational institutions in Nagaland

Educational Institutions		Total
University		3
College:	Total	61*
Stream of studies offered by the colleges	Arts	56
	Science	9
	Commerce	16
	Law	3
	Management	4
District Institute of Education & Training		8
National Institute of Technology		1
Polytechnic Institute		3
Agriculture		1
Engineering		1
Nursing		1
Industrial Training Institutes		8

Source: Directorate of Higher & Technical Education, Nagaland University.

*The streams of studies offered do not tally with the total number of colleges as some of these colleges offer multiple streams of education.

This takes us to the next question. Why would majority prefer arts education even when non arts education yields a higher rate of return? The answer may lie partially in the state of educational infrastructure. As shown in table 4, only 10 percent provide science education comparing to 64 percent providing arts or social science education. Moreover, the state has only one technology and engineering college, which is also established very recently.

Therefore, the problem of accessibility and affordability could be the reason for fewer individuals pursuing non-arts education. Secondly, as colleges and universities produce smaller number of graduates with math and science degree, manpower shortages compels many schools to run with deficit math teacher thereby affecting the quality of math education. As a result, fewer students manage to pursue math, technical and professional education creating imbalances even in the future labour market, which would continue in a vicious circle. Therefore, the challenge for the policy planners for higher education in the State is to improve the quality of education and at the same time develop educational infrastructure so that the former may improve the outcome of the educational system and the latter to expand the opportunities for varied career options and academic choices.

Conclusion

The return to education is found to be positive and significant and the average returns is found to be 5.5 percent, which is somewhat lower as compared to global average of 10 percent derived by Psacharopoulos and Patrinos (2004). However, many studies across the globe have shown contrasting rate of return, some high and some moderately low. The reason for such differences in the rate of return could be due to the nature and state of the economy, the standard and quality of the educational system, growth rates of the economy, business environment, entrepreneurial activity and risk taking, infrastructure and technology etc.

Returns are highest at the primary level of education and become lower at the secondary and tertiary levels. The higher returns at primary level affirm the need to strengthen primary education and lay a strong educational foundation to reap its benefits. Efforts must also be directed to increase retention rates as mean income is found to have increased with increase in the levels of educational attainments. The higher rate of returns for female education also reinforce the argument that female education not only lead to an increased income but also have greater spillover effects on her families, their health and education, which in a vicious circle positively affects the next generation's wellbeing and earning prospects.

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APPENDIX

Table 1A: Age-Earning Profiles by level of Education. 2013-14, Wokha

AGE	Illiterate	Below Primary	Primary	Middle	Secondary	Hr. Sec	Degree	Post Grad
20 - 24	—	—	4000	14141	24000	20000	33500	—
25 - 29	5000	—	7000	15062	14411	19692	16233	25111
30 - 34	2000	—	15000	20950	19687	19666	21709	27750
35 - 39	3000	—	9833	10818	16157	23307	23235	34666
40 - 44	3000	2000	9000	8250	28600	23000	25615	28000
45 - 49	3000	2000	7600	11909	23000	10000	21666	—
50 - 54	9000	7250	12200	20636	25250	19000	47000	12000
55 - 59	2375	8714	19571	15428	33428	37857	36000	—
60 - 64	4200	12333	16090	27555	26250	20000	—	30000
65 - 69	3800	24200	12500	15500	22000	—	—	—
70 +	1833	3500	23333	12500	21000	—	—	—
Gross Average	3435	11482	13720	15931	20635	22839	22000	27925

Source: Own calculations from field survey, 2013-14.