

Role of Education and Training on Labor Earning: A Case Study of Nepal

By

GAUTAM, Kamal Raj

THESIS

Submitted to

KDI School of Public Policy and Management

In Partial Fulfillment of the Requirements

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Professor Kim, Taejong, Supervisor



Professor Lee, Ju-Ho



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Role of Education and Training on Labor Earning: A Case Study of Nepal

Abstract

This study aims to identify the relationship between wage and education, training, and experience among employed workers in Nepal. The study used the cross sectional data of 2017 Nepal Labor Force Survey. A total of 6264 employed workers between the ages of 25 to 65 were studied in the survey. The labor market of Nepal was found dominated by less educated workers with a high drop out from school education. We employed Mincer earning function with dummies of interest to explore the relationship. Rate of return to additional year of schooling was found lower than the South Asian average. We also found the average returns and return to schooling to vary across demographics. These results suggest that our National concern have to direct to ensure the quality of education and reduce drop out from school education.

Introduction

For long time labor has been considered as the indispensable factor of production and that wage/salary is a reward for a contribution on production. Skills, knowledge, and motivation to work are the basic endowment of labor which determines productivity. Previously, labor was rewarded according to their productivity. On the other hand, education helps to increase knowledge, skills and then productivity. Mincer (1975) argues that education means investment in human capital which affects earning rates and labor participation. Further, he contends that schooling is important but schooling only is not sufficient to explain human capital earning and that post-schooling investment on the job is equally important. The post- investment in human capital school may come through both vocational and technical training. Human capital theory proposed by Mincer, explain the role of education and training on productivity of individual worker. According to him education and training are the pivotal factors which increase income of labor by increasing performance (Mincers 1958, 1974; Becker 1964). Education and training provides recent knowledge of machine and technology.

Experience is learning by doing process which provides specialization in work. Previous researches suggest that diminishing rate of return operates in the age of experience to earning over the working life of the worker. According to Mincer (1974), earning as the function of cumulative investment became negative over the age. So we must include concave years of experience term with linear schooling term in earning function.

Das (2018) rightly observed that significantly high increase in temporary employment creates inequality in both developing and developed countries more critically in developing economy because these countries' higher education does not guarantee a higher position of employment. In the developing country where labor market is not well developed, the structure of the market

creates inequality. In Nepal, 11.4 per-cent labor forces are unemployed and due to the unavailability of a job in the country about 4 millions working foreign countries. During the period 2008 to 2017, the government issued approximately 3.5 million work permits to leave the country for work (Nepal Labour Market Profile 2019). When a labor does not get an employment opportunity, he will be ready to work for any position, condition or salary set by an employers. In this situation employer do not want to offer permanent position or written contract to labor. Labor force survey data of Nepal indicates that only 13 percent of the workers have the permanent agreement to their workers and only 28 per-cent workers have written contract. If employers hire labor without written contract, they do not have a legal obligation to pay the minimum wage. Thus the temporary workers were paid low wage than the permanent workers. On the other hand, labor is not a perfect mobile factor of production. Thus wage gap may arise due to the different location of a job. Though education is the major factor of earning, wage may differ by location irrespective of employment, gender and other characteristics (Das 2018).

Nepal recently upgraded to a low middle income country from the least developed country. However, it is suffering from high poverty rate with head counts poverty at 25.2% as of the year 2011, down from 41.8 percent in 1996 (CBS, Nepal Living Standard Survey 2010/11). National Population and Housing Census of different years report that the national literacy rate of above five years increased from 39.6 in 1991 to 54.1 in 2001 and 65.9 in 2011. Which shows that head count poverty rate is decreased as literacy rate increases. Nepal Labor Force Survey 2017/18 which was conducted by the Central Bureau of Statistics has shown that 71.5 percent of the total population are working age population (14+years), out of them 11.4 percent are unemployed. It has shown that labor force participation rate increased with the level of education. According to the survey an average earning of the employed labor is Rs.17809 per month which is not

sufficient for good standard of living. Low average wage rate may be due to the lack of skills and knowledge. The growth rate of GDP between the fiscal year 2009/10 to 2018/19 (past ten years' average) is 4.62 percent which is far below than the growth rate of other developing economies. Per capita income of the country remains low which is \$10034 in 2019 as estimated by Central Bureau of Statistics. Because of the low productivity of labor, high unemployment rate and slow economic growth rate, Nepal remains the least developed.

The constitution of Nepal 2015 declared education and employment as basic human right. However, every year about five hundred thousand labors enter into the labor market of Nepal. Due to the lack of absorption capacity of the Nepali labor market, about one thousand labor forces immigrate to the foreign labor market on a daily basis (NPC, Approach Paper of fifteen plans). Further, the paper reports that due to the unavailability of skilled domestic labor, immigration of foreign labor forces has been increasing day by day. According to NPC, to achieve the decent employment by 2030, there is a need for Nepal to make the plan to connect education to skill, skill to production, production to market, market to employment and opportunity and opportunity to economic development.

Therefore, this paper aims to explore the impact of education, training and experience on the determination of the wage in Nepal using micro data of Nepal Labor Force Survey 2017/18. This study is of particular importance to the policy makers in Nepal as they strive to formulate policies on education and employment that ultimately reduces poverty and inequality. Without understanding a role of education, training and experience on labor productivity, human resource plan is incomplete. Our hypothesis is that marginal return to schooling increases with level of education and there will be different marginal return to schooling among demographic setting.

The rest of the paper is organized as follows: Chapter 2 presents literature review of the topic under study. This is followed by Methodology employed in Chapter 3. Then analysis of results is discussed in Chapter 4 whilst Chapter 5 concludes the paper and offers some recommendation if any.

Literature Review

Previously, there have been various studies on return to education. This study follows the Mincer's earning equation. The study of earning function became popular after the publication of *Investment in Human Capital and Personal Income Distribution* by Jacob Mincer in 1958 on the journal of *The Political Economy*. Mincer (1974) used the following human capital earning function:

$$\ln W_i = \alpha_0 + \beta_0 S_i + \beta_1 X_i + \beta_2 X_i^2 + \epsilon_i$$

If labor continues to work after finishing schooling, Mincer experience function will be

$$X = (A - s - b)$$

Where, A = current age, s = years of schooling, and b = age at the beginning of schooling.

He studied the cross sectional data of male earning in 1959 of the United States. He found that years of schooling and experience have positive impact on the earning of white nonfarm men.

Psacharopoulos (1985) observed social and private rate of returns to education of over 60 countries. The empirical outcome shows that social return of primary education is higher than that of secondary and higher education. The rate of return to education was found higher in developing countries than industrial countries. Further, he also found that rate of return decreased across increasing per capita income and private rate of returns were higher than social return for all level of education. Furthermore, his study shows that difference between physical and human investment is narrow in developed countries whereas investment in human capital is attractive for developing countries than developed countries.

It is generally argued that skilled labor creates more value adds in the production process and get higher wage/salary than unskilled labor because market pays according to the productivity of labor. For instance, Juhn et. al. (1993) studied data of the US economy between the periods 1963 to 1989 and found that a real wage of least skill labor decreased whilst a real wage of the skilled was increased.

Labor, capital, technology and natural resource are deemed as catalysts to the production process. Experiences from South Korea and Japan have shown that human capital is most essential for the development of the country. Korea and Japan are relatively poor in natural resources, but they are developed because of the huge investment in human resources. Becker (1964, p1) states that, 'physical resources explain only a relatively small part of the growth of income in most countries'. Therefore, we cannot undermine the role of education in the overall well being of the country.

According to Mincer (1994), the concept of human capital in the late fifties has accounted labor productivity in economic growth. Finding from U.S data revealed that income inequality in U.S economies arises from labor income. Further, he contends that the human capital analysis has contributed to correct the deficiency of growth model and provided functional approach to an income determination, later it shifted the attention to the wage structure. However, the recent analysis has revealed that wage differential is because of the difference in an accumulation of human capital.

Though, the OLS method of estimating returns to education is common in practices, in many cases it produces a bias result because education is endogenous at least in developing countries. Zhan (2002) examined the rate of returns to schooling in China using the urban sample of third

wave collected by the China Household Income Project (CHIP) 2002. He used both OLS as well as Instrumental Variables (IV) regression. He had included the quadratic terms of years of education to see the different rate of return of education to different level of education. By using the IV regression he concluded that OLS method underestimates the returns to education. He used spouse education as the IV.

Rate of returns to education depends on many factors and type of employment is one of them. Chirwa and Zgov (2001) in their working paper examined the rate of returns to schooling by regular salaried employment and casual employment in the rural labor market of Malawi. Malawi is a developing country where casual employment dominated the labor market. They used a pool sample of regular and casual employment as well as decomposed of a sample between regular and casual employment to evaluate a rate of returns to education. They found the rate of returns to education 6.61 percent in a pooled sample, and 9.4 percent and 5.5 percent for regular and casual employment respectively in decomposed sample. Almost similar results but different in numbers have been found in government sectors in Ghana ranging from 4 to 8 percent and Botswana ranging from 12 to 16 percent (Glewwe 1996; Siphamble 2000). The similar result has been found in the rural labor market in India (Pal 1996).

Although several studies have found the average wage of male to be greater than female worker in most of the labor market, the return to schooling has been found to be greater for women than men. Dougherty (2005) examined the reason why the of women's return to education is higher than that of men. Using the cross sectional data from the National Longitudinal survey of Youth 1979, he found that returns to education were 0.049 and 0.0686 for male and female respectively with a difference of earning of 0.0196, which is statistically significant. The potential factors for higher female coefficient were cited as female attain a higher quality of

education than men, female generally present in a job where schooling is relatively important and endogeneity of female schooling.

Wannakrairoj (2012) used the cross sectional data collected from the labor force survey of 2012 to examine the wage difference between an urban and rural area in Thailand. He used interaction terms area and education on Mincerian wage equation and found that education and geographical area had significant effect on wage. Whereas Lemieux (2014), using National Graduates Survey (NGS) 2005 and 2006 investigated the return to education by using education and job matching framework in Canada. According to Lemieux, each field of study provides specific skills as well as the general skills that are valuable to many other jobs. However, due to the complexity of a job matching, it is difficult to get a job of same study. So he used the dummy variable to separate the field of study which is valuable to given types of job or not. The results show that higher education increase productivity, education helps worker to find the high paying occupation, and workers are more productive and earn more when education and job match.

Montenegro and Patrinos (2014) reviewed the Comparable Estimates of Returns to Schooling of 139 economies using the cross sectional survey data (table 1). They found that the highest return to additional year of schooling in Sub-Saharan Africa is relatively low in South Asia and lowest in the Middle East and North Africa. Returns to education for females are higher than that of males in all regions.

Table 1 Comparable Estimate of Returns to Schooling around the World

Region	Total	Male	Female
Sub-Saharan Africa	12.5	11.3	14.6
High Income Economies	10.0	9.5	11.1
Latin America & Caribbean	9.3	8.9	10.8
East Asia and Pacific	9.0	8.8	9.7
Europe & Central Asia	7.8	7.4	9.8
South Asia	7.2	6.3	9.2
Middle East and North Africa	6.5	6.0	10.2
All Economies	9.7	9.1	11.5

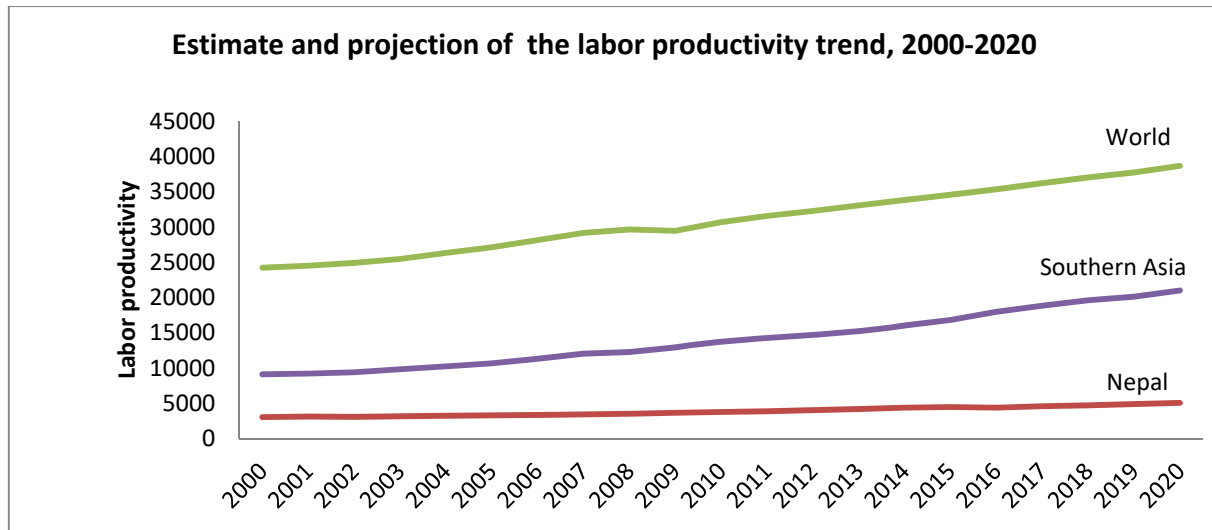
Malik and Awan (2015) investigated return to education in Pakistan by controlling endogeneity and sample selection bias. They use parental education as instruments for IV regression. To estimate the Heckman 2SLS regression model for sample selection bias, landholding and non-earned income as a sample selection variables. Finally, they use simultaneous approach to control sample selection bias along with endogeneity bias. The result had shown that OLS and Heckman estimates are downward bias to return to education.

Das (2018) studied the wage gap by employment status in India which is a developing country. He considered no contract or written job contract for a very short period as a temporary employment. This paper observed that the mean wage of the permanent workers is more than 2.5 times the mean of temporary workers. The return to education at the upper tail is significantly higher than that of a lower tail of the wage distribution irrespective of level of education.

ILO modeled projection of labor productivity shows that labor productivity of Nepal is lower in southern Asia average. ILO defined labor productivity as the output per worker (GDP constant 2011 international \$ in PPP). The labor productivity curve shows not only the low productivity in

Southern Asia, but also an increasing gap in the region. Thus it is important to know whether education is playing the vital role to widen the productivity gap.

Figure 1 Labor Productivity Comparison



Education is considered as the most important connecting tool to employment. However, according to the UNESCO institute of statistics (2012), only 24 per-cent schools have electricity, one percent of primary and 6 percent of the secondary school has internet connection. In addition to this, 0.5 per-cent primary and 4 percent secondary schools use computer assisted instruction. The Nepal Early Grade Reading Assessment (RTI 2014) found that 34 percent of second grade students and 19 percent of third grader students could not read a single word of Nepali. The OECD (2014) report shows that high income countries achieve equally well in math, reading and science score. National Assessment of Student Achievement (NASA) Report of Education Office (2011-2015) found the following average score of the students.

Table 2 National Assessment of Student Achievement Score

	Nepali			Math			Science			Social			English		
	Ave.	Girl	Boy	Ave.	Girl	Boy	Ave.	Girl	Boy	Ave.	Girl	Boy	Ave.	Girl	Boy
Grade 3(2015)	52	54	51	45	45	45	NA	NA	NA	NA	NA	NA	NA	NA	Na
Grade 5(2015)	46	48	46	48	50	48	NA	NA	NA	NA	NA	NA	47	47	47
Grade8 (2013)	48	48	48	35	33	38	41	39	43	41	39	43	NA	NA	NA

**Source: NASA Report of Education Review Office, (2011-2015)*

The table shows that average score of the students is below 50 percent in each subject. In addition to this, 50 percent of the students reach Grade without demonstrating the standard in English, Math, and Science. The score of girl students seems relatively higher than the score of boys.

Data and Methodology

To analyze the role of education, training, and experience on wage, we use the micro data of Nepal Labor Force survey 2017/18. This survey used the concepts and definitions of labor force statistics recommended by 19th ICLS. To achieve a high level of efficiency of employment/unemployment estimates 14 domain was considered as the primary strata. Then the total sample of 18000 households was selected from 900 primary sampling units. Although households were sampled, all members of households were enumerated. There were 77,638 individual observations in our data. However, in this study, we are interested in employed individuals of 25 years old to 65 years old. The expected year of schooling in Nepal is five years and the maximum year of schooling is 20. In public sectors of the Nepal maximum age of retirement is 65. So this study considered the 25 to 65 age group as an active labor force participation age. Out of 77,638 observations in the data set, 6269 observations are considered for this study. From these interested observations, four extremely over reported and one extremely low reported case were excluded for analysis purposes.

In this paper we use earnings as the monthly earning of labor. Those who get daily wage may get it whenever they work. In 2017, there were 100 total national holidays including Saturday making average working days in month 22. To compute the monthly earning of a daily worker we considered 22 working days. The monthly wage of weekly wage earners was computed by considering 4.2857 average weeks in a month. The workers, working in piece rate and contract, were excluded because it is difficult to compute the monthly earning. The monthly earning was transformed by taking a natural log of monthly earning to compute the percent increase in earning by additional years of schooling.

Level of education has eight categories. A laborer who never went to school and education below a first grade of schooling is considered as the zero years of schooling. Bachelor's degree completion was considered as three years of education, although recently it has changed to four years. Master's degree was considered as two years of education. The Professional level of education was also considered as three years of schooling. Thus completion of Bachelor's degree, Master's degree and Professional level became 15, 17 and 20 years of schooling respectively. Technical vocational training is the accumulated month of training. The male dummy was coded 0 for female and 1 for a male. There were two types of contract basis, written contract basis was coded as 1 and verbal contract agreement was coded 0. Similarly permanent employment is a binary dummy coded 0 if the employment type is temporary and 1 if an employment type is permanent. The Provinces are the political division of the federal democratic republic of Nepal. We have seven provinces some has got their name and some are in the process of naming which are indicated by numbers.

In this study we employ the semi log-linear multiple regression model to estimate the result. We use relevant dummy variable to get reliable results. It employed STATA-16 to estimate the model. Suitable statistical tools will be used to test the reliability of an estimate. The Mincer wage equation use in this study is presented below.

$$\text{Ln}W_i = \alpha_0 + \beta_0 S_i + \beta_1 X_i + \beta_2 X_i^2 + \beta_3 T + \epsilon_i$$

Where, $\text{Ln}W_i$ = Natural logarithm of a monthly wage for individual,

α_0 = Autonomous wage ,

β_0 = Average rate of returns to additional years of schooling,

S_i = Years of Schooling

β_1 = Average returns to additional years of experience,

X_i = Years of experience,

β_2 = Coefficient of the square of the years of experience,

T_i = Total accumulated month of trainings,

β_3 = Coefficient of accumulated month of trainings,

X_i^2 = square of the years of experience

,

ϵ_i =

error terms or residual factors such as training, health, gender, sector of work etc.

If a labor continue to work after finishing the schooling Mincer experience function will be,

$$X = (A - s - b).$$

In Nepal, expected years of schooling is 4.7 years. So we used experience as (age- s- 5).

We started by using a multiple least square Mincer equation of earning first to compare returns to schooling to other countries. The basic model was the Mincer wage equation with the dummies of male, permanent, written contract and provinces. Different techniques have been used to reduce the schooling endogeneity in many research papers. We do not have suitable instrument variable in our data. Even If we do not have reliable instruments OLS is the best linear unbiased estimate (BLUE).

Classical least squares give an unrealistic result when effect of outlier is strong (Verardi & Croux, 2009). Rousseeuw and Leroy (2003) discussed about the three types of outliers in the data set. Vertical outliers are corresponding to error terms not outlying in explanatory variables. Good leverage points are outlier of explanatory variables closer to the regression line which have no effect on estimators but affect the standard error of regressor. Bad leverage points are outlier of explanatory variables far from a regression line that affect both the coefficients and standard errors. There are different robust techniques available in the field of statistics. The Robust standard error method used to normalize the variance of error term, does not deal with a coefficient estimates. Median minimized the sum of absolute errors helps to protect from vertical outlier but it does not protect from bad leverage and not based on a least square technique. Another technique is the generalized median regression. This technique standardized the residuals by a measure of dispersion and reweighted OLS estimators, which allow increasing efficiency but do not protect from bad leverage (Verardi & Croux, 2009). Rousseeuw and Yohai (1984) propose S-estimators which estimate the coefficient that minimizes the dispersion of the residuals that is less sensitive to extreme values than variance. The MM-estimator, which was introduced by Yohai (1978), iteratively reweighted OLS by taking the initial S-estimate that combines a high breakdown point and high efficiency. This algorithm is available in STATA. This paper used the MM-estimators to compute the robust regression at the default efficiency level 70 percent.

To estimate a difference in returns to education between male and female, we have interacted male dummy with years of schooling. Similarly we have interacted permanent dummy and years of schooling and written contract dummy and years of schooling to estimate the difference in

returns to education between permanent and temporary, and written contract and verbal contract employees.

Result and Discussion

Descriptive Analysis

Summary of the variables used in this study is presented in table 3. Total observations included in study are 6264. These are the employed individuals between the ages 25 to 65 years. The log value of monthly earnings ranges from 7 to 12 and mean earnings is 9.5. Years of schooling ranges from no schooling 0 to professional degree 20. Mean of years of schooling is about seven years. Although net enrollment in the primary level is about 97 percent most of the students drop out before completing the basic level (Eight grades). The World Bank Report (2013) shows that at a higher level of education, the rate of unemployment and underemployment is higher than that in the lower level of education. These findings highlight the cause of limited incentive to prepare for a higher level of education.

Table 3 Summary of Variables

Variable	Observations	Mean	Standard Deviation.	Minimum	Maximum
Log monthly earning	6264	9.535	.546	7.313	11.983
Years of schooling	6264	6.893	5.59	0	20
Months of training	6264	.86	3.565	0	60
Experience	6264	26.854	12.695	3	60
Experience square	6264	882.28	769.516	9	3600
Male	6264	.742	.437	0	1
Permanent agreement	6264	.154	.361	0	1
Written contract	6264	.332	.471	0	1
Provinces	6264	3.677	1.943	1	7

The accumulated month of vocational and technical training ranges from 0 to 60 months. Mean of months of training is less than a month. Mean of the male is .74 which means female employees are only 26 percent. Similarly only 15 percent has a permanent job and 33 per-cent

workers have written contract. There are seven provinces in Nepal. In this study province one was taken as the base group.

Table 4 Distribution of Employees by Contract and Agreement Types

Agreement type	Contract type		
	Verbal contract	Written contract	Total
Temporary agreement	4139 <i>(66.08)</i>	1161 <i>(18.53)</i>	5300 <i>(84.61)</i>
Permanent agreement	44 <i>(0.70)</i>	920 <i>(14.69)</i>	964 <i>(15.39)</i>
Total	4183 <i>(66.78)</i>	2081 <i>(33.22)</i>	6264 <i>100.00</i>

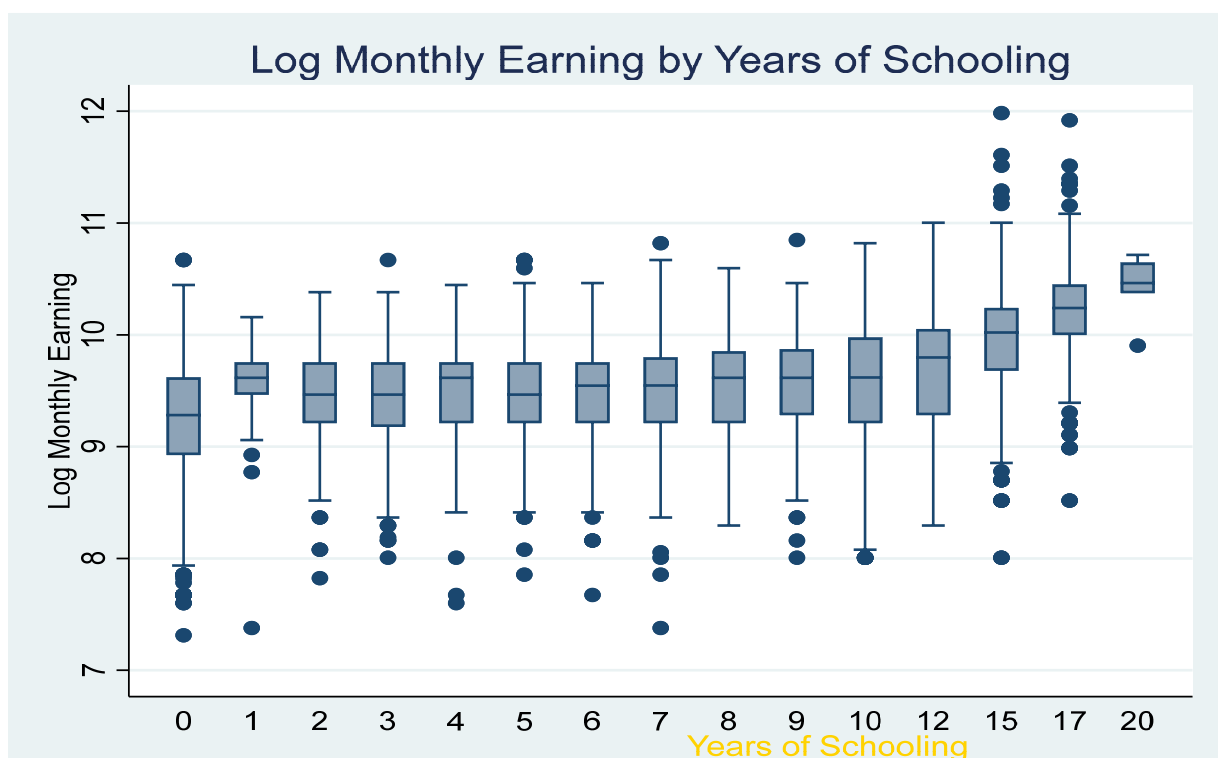
Note: Number on square brackets represents the cell percentages

The distribution of employees by agreement and contract types is presented on table 4. The table shows that 66 percentages of employees have no permanent jobs and written contracts. About 18 percent of temporary employees have written contracts and 15 percent of employees have written contract and permanent jobs. Less than one percent workers have a permanent job but they have no written contracts. The structure of the labor market indicates that most of the employees are working in vulnerable condition; they do not have job security and social security. Due to the unavailability of job security (permanent and contract job) and low wage rate in Nepal, youth labor forces are leaving the country for foreign employment. Due to this obligation, Nepal has to face scarcity of physical and high skilled labor forces in the domestic market.

The box plot of the monthly earnings by years of education is presented in figure 2. The lowest median wage seems to be found in workers who do not have formal education which comprises 27 percent of the total employed workers. In addition, there is a wide variation of the income in

this group. The median, return to schooling of one year of schooling, seems higher than both no schooling and two years of schooling. However, an upper limit of interquartile range is not different from two years of schooling. The high median income may be due to the manifestation of about 7 percent of employees with a written contract in this group, whereas there were only 2 per-cent employees having such contract in a group of two years of education.

Figure 2 Log Monthly Earning by Years of Schooling



Years of schooling seems not so efficient to increase the earnings until ten years of education. After that level, schooling has become a very significant factor to increase the median earning of the employees. It is important to note that only 15 percent of laborers have written contracts in the subgroup below ten years of education, whereas 82 per-cent laborers have the written contract in the subgroup above 12 years of education. Written contract workers are probably in the formal working sector where a capital labor ratio is higher compared to the informal sector.

The variation of first quartile, third quartile, range, interquartile range in figure shows the heterogeneity of returns to schooling. The points outside the whiskers show the outlier. Thus it is essential to minimize influence of extreme values in regression function.

Regression Analysis

Regression results of the Mincer equation and basic model where Mincer equation controlling with additional male, written contract, permanent and province dummies is presented on table 5. The Mincer equation in the first column shows that additional one year of schooling increases earnings by 6 percent, an additional one month of technical and vocational training increases earnings by 0.6 percent, and an additional one year of experience increases earnings by 2.9 percent. The experience square coefficient is negative as expected. All coefficients are statistically significant. The return to schooling in Nepal seems to be lower than the South Asian average which was 7 as reported by Montenegro and Patrinos (2014). The low return to schooling attributed to low equality of education. The ERO (2011-2015) report shows that 50 percent of the students reach Grade 8 without showing the standard in English, Math and Science. We know from the box plot additional years of education below 12 years has no significant impact to increase earnings, interquartile range is almost stable. Further 74 percent employees have at most 10 years of schooling and only 26 per-cent employees have education level higher than 10 years. If the education increases efficiency, presence of a larger proportion of less educated labor in the labor market of Nepal remains the main reason for low average returns to schooling in Nepal. Other major factors are high educational unemployment, subsistence agriculture and insufficient industrial development. An availability of more Capital to the labor and innovative education is essential for high returns to education.

The Second regression equation presented in table 5 shows average return to an additional years of schooling is 3.5 percent. This model is controlled by additional variables male, contract types, job types, and provinces dummies. Wage discrimination among gender, types of job, types of contract, and provinces were found in this model. This result indicates that if wage difference occurs based on demography and geography, Mincer equation over estimates the average return to education. So, it is desirable to control the Mincer equation by relevant variable to get the average returns to education. In addition to this, the result shows that on average, permanent employees earn 26 percent more than temporary workers; the male workers earn 37 percent more than female workers, while written contract workers earn 7 percent more than the verbal contracted workers. All coefficients are statistically significant. The Wage gap between temporary and permanent workers seems common in many economies. Das (2018) observed a mean wage of permanent is 2.5 times more than the temporary workers in India.

Province 1 is used as the base to compute wage differences among the provinces. The highest average wage is found in Bagmati province which is situated in the central part of Nepal. More job opportunities are available in this province because federal ministries, INGOs and the central office of large business and corporate sectors are concentrated in Kathmandu, the capital city of Nepal. The lowest average wage was found in Sudurpachim province which is far from federal capital Kathmandu and educational indicators are not so good compared to other provinces. Province two also seems to have a low average wage than province one but coefficient is not statistically significant. Karnali province has the most adverse topography and the rural areas, but the average wage was found higher than the four other provinces except Gandaki and Bagmati. This may be due to additional incentives (outstation) provided by the government and other corporate sectors to coax people to work in this province.

**Table 5 Estimating Returns to Schooling Using Mincer Equation and Regression
Controlling Male Employment types and Province Dummy**

VARIABLES	(1) Mincer	(2) Basic	(3) MM Regression	(4) MM Regression
Year of schooling	0.060*** (0.001)	0.035*** (0.002)	0.063*** (0.001)	0.035*** (0.002)
Month of training	0.006*** (0.002)	0.007*** (0.002)	0.006*** (0.001)	0.006*** (0.001)
Experience	0.029*** (0.002)	0.016*** (0.002)	0.025*** (0.003)	0.017*** (0.002)
Experience square	-0.0003*** (0.000)	-0.0002*** (0.000)	-0.0002*** (0.000)	-0.0002*** (0.000)
Male		0.374*** (0.013)		0.330*** (0.019)
Permanent agreement		0.265*** (0.019)		0.217*** (0.025)
Written contract		0.077*** (0.017)		0.112*** (0.027)
Province No. 2		-0.032 (0.020)		-0.012 (0.022)
Province Bagmati		0.227*** (0.018)		0.239*** (0.021)
Province Gandaki		0.125*** (0.020)		0.144*** (0.021)
Province No.5		0.050** (0.019)		0.053*** (0.020)
Province (Karnali)		0.114*** (0.024)		0.163*** (0.023)
Province(Sudurpachim)		-0.056*** (0.020)		-0.096*** (0.022)
Constant	8.620*** (0.037)	8.623*** (0.037)	8.703*** (0.040)	8.657*** (0.045)
Observations	6,264	6,264	6,264	6,264
R-squared	0.244	0.386		

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

To control an influence of outlier in the model MM regression, the default efficiency of 70 percent was performed. The results are shown in the column three and four respectively of table 5, estimates seems marginally change in MM regression. MM regression of Mincer equation increases return to schooling marginally by 0.3 percent and experience coefficient marginally

decrease by 0.4 percent. There are marginal change of standard error and coefficients of base model but coefficient of province two dummy is still insignificant. This shows that even outlier is presented in the sample but has not significant effect.

When the larger wage difference is present between genders, types of job and types of contract, it is desirable to study the different rates of returns to schooling among these categories. So, we have allowed the interaction between male, permanent, and written contract to the years of schooling. The regression results are presented in table 6. In Column one, the regression model with interaction between male dummy and years of schooling is presented, interaction between written contract dummy and years of schooling, and interaction between permanent employment dummy and years of schooling are presented in column two and three respectively. These flexible models allow different rates of returns to education for males and females, written contract and verbal contract, and permanent employees and temporary employees.

The regression results in column one clearly show the higher return to schooling for females than for males. The return to the additional years of schooling for the female is 4.4 per-cent and 3.2 per-cent for male. MM regression in column four shows 5 percent for women and two percent less about 3 per-cent returns to education for men. Dougherty (2005) found statistically significantly higher coefficient for the female in 18 studies out of 27. The coefficient of male dummy seems higher in unrestricted model than a basic model presented in table 4. It indicates a high wage gap between uneducated male and female. There is almost equal pay in the formal sector's jobs where higher education is necessary. This is the main reason behind higher returns to education for the female than the male employees. As assert by Dougherty (2005) female attains a higher quality of education than male. The girls' average score in the major subjects is

found relatively higher than that of boys in Nepal. This may be another justification for high return to schooling for the female.

Column two in table 6 shows that additional one year of education increases the earnings by 6 percent to written contract worker where return to schooling for the verbal contract worker is about 2 percent. We can observe marginal changes of these coefficients in MM regression in column five. Decomposed Mincer earning function for the contract and casual worker have shown that rate of return to education of regular salaried employment is twice higher (9.4) than the casual worker (5.5) in Malawi, similar coefficient ranges from 8 to 4 percent in Ghana, and 16 to 12 percent in Botswana (Chirwa & Zgovu, 2001). Similar types of regression have shown 8 per-cent return to the written contract worker and 4 to the non contract worker in this study (regression is not reported in this paper). The verbal contract workers are generally physical labor most of them works for daily wage (46 percent), education may be less important to them.

Table 6 Different Returns to Schooling across Gender, Types of Contract and Type of Job

VARIABLES	(1) Male Vs Female	(2) Written Vs Verbal	(3) Permanent Vs temporary	(4) MM Robust Regression	(5) MM Robust Regression	(6) MM Robust Regression
Years of schooling	0.044*** (0.002)	0.022*** (0.002)	0.031*** (0.002)	0.050*** (0.003)	0.023*** (0.002)	0.031*** (0.002)
Months of training	0.007*** (0.002)	0.007*** (0.002)	0.007*** (0.002)	0.006*** (0.001)	0.007*** (0.002)	0.006*** (0.001)
Exp	0.018*** (0.002)	0.018*** (0.002)	0.016*** (0.002)	0.018*** (0.002)	0.018*** (0.002)	0.016*** (0.002)
exp2	- 0.000*** (0.000)	- 0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Male	0.455*** (0.019)	0.391*** (0.013)	0.379*** (0.013)	0.432*** (0.021)	0.350*** (0.019)	0.339*** (0.019)
Permanent	0.272*** (0.019)	0.257*** (0.019)	0.013 (0.045)	0.214*** (0.024)	0.207*** (0.023)	-0.007 (0.042)
Written contract	0.070*** (0.017)	-0.26*** (0.031)	0.095*** (0.017)	0.113*** (0.026)	-0.185*** (0.037)	0.132*** (0.027)
Schooling*male	- 0.012*** (0.002)			-0.019*** (0.003)		
Province No. 2	-0.032 (0.020)	-0.042** (0.020)	-0.033* (0.020)	-0.016 (0.021)	-0.015 (0.022)	-0.011 (0.022)
Province Bagmati	0.222*** (0.018)	0.228*** (0.017)	0.225*** (0.018)	0.223*** (0.020)	0.241*** (0.020)	0.240*** (0.021)
Province Gandaki	0.123*** (0.020)	0.132*** (0.020)	0.124*** (0.020)	0.139*** (0.020)	0.156*** (0.021)	0.148*** (0.021)
Province No.5	0.045** (0.019)	0.050*** (0.019)	0.047** (0.019)	0.044** (0.020)	0.054*** (0.020)	0.050** (0.020)
Province (Karnali)	0.111*** (0.024)	0.111*** (0.023)	0.110*** (0.024)	0.154*** (0.022)	0.163*** (0.023)	0.160*** (0.023)
Province(Sudurpachim)	- 0.056*** (0.020)	- 0.064*** (0.020)	-0.060*** (0.020)	-0.094*** (0.022)	-0.109*** (0.022)	-0.100*** (0.022)
Schooling* Written		0.036*** (0.003)			0.032*** (0.003)	
Schooling*Permanent			0.022*** (0.004)			0.019*** (0.003)
Constant	8.548*** (0.039)	8.660*** (0.037)	8.647*** (0.037)	8.573*** (0.043)	8.689*** (0.044)	8.679*** (0.044)
Observations	6,264	6,264	6,264	6,264	6,264	6,264
R-squared	0.390	0.403	0.390			

Different returns to schooling between the permanent and temporary worker seems in a column four of table 6 where return to schooling for the permanent worker is about 5 percent and 3 percent to the temporary workers. Almost similar coefficient estimates seems MM regression in column six. Generally the permanent workers are the employees of government sectors or big business and corporate house where we can expect high capital to per unit of labor than other sectors. A good working environment and a large capital labor ratio are the major reason for high returns to schooling for the permanent worker. Though coefficient of permanent dummy has positive sign in the OLS model but it has negative sign in MM regression. Since coefficient of the MM regression is reliable and consistence than the OLS regression but in both of the model coefficient is not statistically significant. So we do not reject a null hypothesis that there is no average wage difference wage between permanent and temporary workers who do not have the education.

As the basic model in table 5, statistically significantly lowest average wage seems in Sudurpachim province. Province two also found lower average wages than province one but the coefficient is not significant.

Conclusion

This study used the most recent data from Nepal Labor Force Survey 2017. The result reveals the low average returns to education in Nepal in comparison to other developing countries. The observed lower return to schooling is attributed due to the domination of unskilled, less educated, non contract, and temporary workers in the domestic labor market. Furthermore, excess supply of laborer than the absorption capacity of the economy is another contributing factor to low wage and low returns to education. One of the mitigating channels to overcome the observed problem is for the Government to make a deliberate policy that promotes labor contract resulting into job security. The proposed intervention will go a long way and helps to avoid the brain drain and labor force migration to the foreign country. On the other hand, the study reveals high rate of return in higher level of education compared to the average year of schooling which is comparatively low. Thus the Government ought to devise the policy that helps to reduce early school drop-out before completing basic education. Furthermore, female education is found effective to increase the earnings and ultimately to reduce the gender wage gap. Therefore, there is a need for concerted efforts from the Government, Civil Society and parents to promote girl education.

As already discussed above, higher quality education helps to widen horizons of job opportunities and higher payment. However, insufficient educational infrastructures in public school, low incentive to higher education, low teachers' salary, and high student teacher ratio are the major constraints to ensure good quality of education in Nepal. As such, there is a need for the Government to swiftly address the observed challenges to achieve the desired results. In the context of the fourth industrial revolution, the education system of Nepal needs to urgently embrace the current innovative ICT generation for improved delivery of content in classrooms.

This will assist in not only enlarging a scope of job but also develop the self entrepreneurship among school leavers.

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