

THE EDUCATIONAL KUZNETS CURVE: A CASE OF NEPAL

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ABSTRACT

Education is among the basic human needs and one of the components of well being in the modern world. Equal distribution of education is of great interest in public policy analysis. Spending in education represents substantial share of government revenue. The inequality in educational distribution represents large welfare loss. The purposes of this article are three folds. First, it calculates average years of schooling. Second, it estimates educational inequality in terms of standard deviation of schooling. Third, it examines the Educational Kuznets Curve in case of Nepal and answers the question: does it fit? This is a quantitative study based on the secondary data collected and published by Central Bureau of Statistics. The study finds that the average years of schooling are increasing over the census years. It stood at 0.125 years in 1952 for all population and 0.245 and 0.019 respectively for males and females. The same data for all population, males and females for the year 2001 are 4.385, 5.119, and 3.083 years respectively. The data on standard deviation of schooling show that they are all in increasing trend from the census year 1952 to Census Year 2001. With the help of econometric test of both linear and nonlinear quadratic equations, this study concludes that the Educational Kuznets Curves does not exist in Nepal due to very low average years of schooling.

BACKGROUND

Education is an important component of well being among human basic needs. Hence the distribution of education matters in public policy analysis. Spending on the education represents a substantial share of government budgets in the form of subsidies both in the developed and less developed countries. Since the main goal of education is to increase equal economic opportunities. So access to education determines who enjoys economic opportunities provided by the government. Education system that spreads its benefits equitably among the population is always welcome; education that is distributed unequally needs to be evaluated.

Equity of access in education is a continuing problem (ADB 2003). As the development gets momentum societies get division as between haves and have not because of the misdistribution of resources. When it happens it creates large social, humanitarian and welfare losses. Inequality does not only create a conflict among various socio-economic classes, but it alarms the policymakers about how to reduce it (Kanel 1993). Any regularly encountered inequality in access to education is a waste of valuable talents (Duru–Bellat 2004). If peoples'

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abilities are normally distributed, then a skewed distribution of education opportunity represents larger welfare loss (Thomas 2001). This paper answers the questions. Like, what are the average years of schooling of Nepal from Census Year 1952 to 2001 Census Year second, what is the extent of educational inequality as measured by standard deviation of schooling? and the third, does the Educational Kuznets Curve exist in Nepal?

The remaining part of the paper is organized as follows. Section II presents the introduction of Kuznets cure and Educational Kuznets Curve. Section III explains research methodology: data and statistical tools, formula for average years of schooling and standard deviation of schooling. Section IV, highlights data analysis and presentation. The last section presents conclusion.

THEORETICAL CONCEPT

CONCEPT OF KUZNETS CURVE

The concept of Kuznets Curve was introduced by Simon Kuznets in 1995 with the publication of his seminal article entitled “Economic Growth and Income Inequality” in *The American Economic Review*. With this publication Kuznets made a remarkable contribution. He established a relationship between increase in per capita income and income inequality and concluded that the economic progress measured by per capita income is initially accompanied by rising inequality, but with the time interval the inequality declines with increasing per capita income (Kuznets 1995). Following the above hypothesis if we plot per capita income on the X-axis and measure of inequality on the Y-axis, the hypothesis suggests a plot that looks like upside – down ‘U’: which gave the name inverted ‘U’ hypothesis.

THE EDUCATIONAL KUZNETS CURVE

Following the ordinary Kuznets Curve, there is an increasing attention on defining Educational Kuznets Curve. The Educational Kuznets Curve has been defined as with the Ordinary Kuznets Curve. The Educational Kuznets Curve show the inverted ‘U’ shape relationship between educational inequality and educational attainment. This relation concludes that as the development takes place the educational inequality increases initially and but with the change in time the educational inequality declines with increasing educational attainment. For this purpose the educational inequality was measured by standard deviation of schooling. The Kuznets Cureve in education exists only when standard deviation of schooling (SDS) was used as an inequality measure. This method was used by various economists including Ram (1990), London (1990), Thomas et al. (2001), Thomas et al. (2002), Lim and Kam (2007) and others.

RESEARCH METHODOLOGY

DATA AND STATISTICAL TOOLS

This is a quantitative study based on the time series secondary data set obtained from Central Bureau of Statistics (CBS) in different Census Years. This article calculates average years of schooling (AYS) and standard deviation of

schooling (SDS) and uses these variables as tools to examine the existence of Educational Kuznets Curve of Nepal. The statistical tools used in this study to compute AYS and SDS were followed from the work of Thomas, V., Y. Wang and X. Fan (2001).

AVERAGE YEARS OF SCHOOLING (AYS)

This study measures educational attainment in terms of AYS based on the population above 6 years of age. The AYS of the population is used as a proxy for the educational attainment. Following formula was used to calculate the AYS.

$$\mu = AYS = \sum_{i=1}^n p_i y_i$$

Where,

μ is the average years of schooling (AYS) for the concerned population,

Pi stands for the proportions of population with certain levels of schooling,

yi stands for the years of schooling at different education attainment levels,

n is the number of level/categories in attainment data, and n=6 in this research.

STANDARD DEVIATION OF SCHOOLING (SDS)

This study examines the educational inequality in terms of SDS. The way to measures SDS is given below.

$$\sigma = SDS = \sqrt{\sum_{i=1}^n p_i (y_i - \mu)^2}$$

The variables are just defined as above.

RESULTS AND DISCUSSION

AVERAGE YEARS OF SCHOOLING

Average years of schooling are the years of formal schooling received, on average, by youths and adults of specified ages. The number of years of schooling is a popular but inaccurate measure of human capital investment, however, because it assumes that the quality of each year of schooling in each geographical area is same (World Bank 2008). Much emphasis has been given to higher years of schooling due to the fact that it is the only avenue of hope for poor children to escape from poverty (Todaro 2000). The average years of schooling per worker are associated with growth in output per worker (Meier and James 2007). This study estimates average years of schooling of male, female and for both sexes for all census years. The average years of schooling were calculated using the equation as given in the sub topic ‘‘Average Years of Schooling’’ and it is presented in Table 1.

Table 1. Average Years of Schooling by Sex in Different Census Years, 1952-2001

Year	Average Years of Schooling		
	All	Male	Female
1952	0.125	0.245	0.019
1961	0.437	0.620	0.073
1971	0.700	1.330	0.228
1981	1.310	2.075	0.674
1991	2.285	3.342	1.396
2001	4.385	5.119	3.083

Source: Various issues of Population Monographs of Nepal and Author's calculation.

Table 1 provides average years of schooling by sex in different Census years from 1952-2001

Table 1 shows the increasing trend of average years of schooling from the census year 1952 to 2001

According to Table 1, the average years of schooling of total population start from 0.13 years in 1952 and 4.40 years in 2001. The average years of schooling of 0.13 and 4.40 years refer that, on average, a person went to school 0.13 years and 4.40 years in the years 1952 and 2001 respectively. The average years of schooling in 1952 were found quite low due to the fact that the percentage of population with no schooling was larger in the year 1952. When the percentage of this population has fallen down the years of schooling has gone or increased up.

As shown in Table 1 the average years of schooling for male start with 0.25 years in 1952 and reached 5.12 years in 2001. It implies that, on average, a male went to school 0.25 years in 1952 and 5.12 years in 2001. These years in 1952 and 5.12 years in 2001. These years of schooling are higher than that of total population because of two reasons. On the one hand the percentage of male population with no schooling is smaller than the total population and on the other hand the percentage of male population with other levels of schooling is higher than that of total population. During the periods of 5 decades the average years of schooling for male have multiplied by 21 times.

For female the average years of schooling are 0.02 years in 1952 and 3.08 in 2001. It indicates that, on average, a female went to school 0.02 years in 1952 and 3.08 years in 2001. The average years of schooling has increased by 154 times from 1952 to 2001. The very low average years of schooling of female is due to high percentage of female illiteracy every year and low percentage of population with other levels of schooling. The low average years of schooling of female as compared to male indicates the common traditional culture of male dominated society in Nepal.

In 1952 the female average years of schooling is lower by 92 percent than male AYS. In 1961 it is lower by 88 percent. The rate declined by 82

percent, 67 percent, 58 percent, and 25 percent respectively in the 1971, 1981, 1991, and 2001.

The AYS of this study is lower than the mean years of schooling of 7.5 years as reported by Nepal Living Standards Survey 2003/04, NLSS II, (CBS 2004). The mean years of schooling of male is 7.6 while that of women is 7.4 The AYS of rural population is 6.9 and that of urban population is 9.3 as reported by above survey. The reason behind this face is that NLSS II reported the mean years of schooling of the population who ever attended school.

STANDARD DEVIATION OF SCHOOLING

Standard Deviation of Schooling (SDS) is easily available and widely used measure of inequality in education. It explains the deviation of the sampled observation from the mean value. The standard deviation of schooling was calculated by using the formula as given in the sub topic “Standard Deviation of Schooling.” It is presented in Table 2.

Table 2. Standard Deviation of Schooling, 1952 – 2001

Year	Average Years of Schooling		
	All	Male	Female
1952	0.54	0.88	0.24
1961	1.69	1.82	0.67
1971	2.06	2.84	1.28
1981	2.80	3.46	2.07
1991	3.53	4.03	2.92
2001	4.80	4.70	4.16

Source: Various issues of Population Monographs of Nepal, Table 1, and Author’s calculation.

Table 2 reports standard deviations of schooling of all population, and males and females for various years. The standard deviations of all population, male and female are all increasing from the Census Year 1952 to 2001 Census year. The SDS of female population is lower in every census year whereas the male population is greater. The SDS of total population lies in between the male and female population in every year.

DOES THE EDUCATIONAL KUZNETS CURVE EXIST IN NEPAL?

Kuznets has suggested that it is an unavoidable characteristic of the development process that income inequality should exhibit an inverted “U” shape. Should it also be the case for educational inequality? Is this confirmed by data from Nepal?

Most of the previous studies have considered education as the synonymous of human capital. Ram 1990 and London 1990 use the standard deviation of schooling to measure education dispersion. These studies reveal the existence of an Education Kuznets Curve: education inequality is a concave function of average education level or average years of schooling. On the other hand Chechi 2001, Castello and Domenech (2002) and Thomas, Wang and Fan (2001) use Gini

coefficients to calculate educational inequality, and they all find that a negative relationship between average education level and education inequality.

As suggested by Ram (1990) and Londono (1990), there is a “Kuznetsian tale” with distribution of education. As a country moves from the zero to maximum level of education, the SDS first increases and then declines. Using the SDS, a clear pattern of education Kuznets curve exists, by time series data. As AYS increases, the SDS first rises, reaching a peak at around 6-7 year of schooling, and then declines. The standard deviation of schooling for India, Tunisia and several other countries rose drastically over the time, showing a widening spread of educational attainment. For Thailand it was “U” shaped curve, declining first and rising later. For Korea it was an inverted “U” shape, rising first and declining later. It was declining continuously for Canada, Rominad and Poland (Thomas 2001).

To examine the Educational Kuznets curve this study calculated as AYS and SDS which are presented in Table 1 and 2 respectively. The calculated data shows that the AYS and SDS are increasing from the Census Year 1952 to Census year 2001. In the Census year 1952 the values of AYS were very low for total population as well as male and female. In the Census Year 1952 the values stood at 0.125 for total population; 0.245 for male and 0.019 for female. In the year 2001 the values for total population and male and female were 4.385, 5.119, and 3.083 respectively. The time series data from Nepal shows the SDS of all population, male and female are all increasing from the Census Year 1952 to 2001 Census Year. The value of SDS for total population in 1952 is 0.54, and 0.88 and 0.24 for male and female respectively. The values for the latest Census Year 2001 are 4.80, 4.70, and 4.16.

A cursory look on Table 1 and Table 2 shows that there is no existence of Educational Kuznets Curve. The reason behind this observation may be very low average of schooling. This is the similar conclusion as that of Thomas, V; Y. Wang and X. Fan 2001 (2001) who have mentioned that for a country that has low school attainment, AYS, helping more people to get education may enlarge the SDS. The spread of education will be widened as some more people are getting higher education. The SDS would rise in this case (Thomas, V., Y. Wang and X. Fan, 2002). Hence it can be said that as the average years of schooling increases further the standard deviation will start to decline but it needs further investigation.

The econometric tests of Educational Kuznets Curve, for all population, are presented in equations A and B in Appendix 1. Equation A shows that the relationship between SD and AYS is linear. This result is significant at 0.3 percent level of significance. Equation B reveals that the relationship between SD and AYS is nonlinear which is significant at 8 percent level of significance. When compared these two regression equations, linear and nonlinear, the linear regression equation became highly significant. Thus present study accepted the linear relationship between the SD and AYS. And the econometric study, again, concludes that the Educational Kuznets Curve does not fit in Nepal.

CONCLUSIONS

Estimation of estimate average years of schooling, measure educational inequality in terms of standard deviation of schooling which fits with educational Kuznets curve highlights several facts. First, in Nepal, there is increase in the average years of schooling for both sexes in all census years. And the average years of schooling of male lag behind the advantage years of schooling of female. This is reflected by the increase in the literacy rate in every census year. Second, the educational inequality as measured by standard deviation of schooling is on rise for both sexes over the census years. Third, the analysis of time series data shows that there is no existence of educational Kuznets curve if it is measured in terms of standard deviation of schooling. The reason behind this fact may be very low average years of schooling.

APPENDIX

Model for testing Educational Kuznets Curve

$$SD = \beta_0 + \beta_1 (AYS) + U_i \dots\dots\dots (A)$$

SD = standard deviation of schooling

AYS = Average Years of Schooling

β_0 = Constant

β_1 = slope Parameter

U_i = Error Term

$$SD = \beta_0 + \beta_1 (AYS) + \beta_2 (AYS)^2 + U_i \dots\dots\dots (B)$$

SD = Standard Deviation of Schooling.

AYS = Average Years of Schooling.

β_0 = Constant

β_1 = slope Parameter

β_2 = Slope Parameter.

U_i = Error Term.

Results of Econometric Test of Educational Kuznets Curve

$$SD = 1.20 + 0.89 (AYS) \dots\dots\dots (A)$$

Se = (0.302) (0.143)

t = (3.95) (6.26)

Sig. at (0.017) (0.003)

$$SD = 0.68 + 1.81 (AYS) - 0.202 (AYS)^2 \dots\dots\dots (B)$$

Se = (0.27) (0.35) (0.076).

t = (2.50) (5.04) (-2.64)

Sig. at = (0.088) (0.015) (0.078)

WORKS CITED

- Asian Development Bank. 2003. *Education*. Asian Development Bank, Manila. Pages 62.
- Castello, A., and R. Domenech. 2002. Human Capital Inequality and Economic Growth: Some New Evidences. *Economic Journal* 112(478).
- CBS 2003. *Population Monograph of Nepal*. Vol. 1, CBS. Kathmandu, pages 73.
- Checchi, D. 2001. Education, Inequality, and Income inequality. Distributional Analysis Research Programme, Discussion Paper No. DARP 52, School of Economics, London.
- Duru-Ballat, M. 2004. *Social Inequality at Schools and Educational Policies*. International Institute for Educational Planning, UNESCO, pages 19.
- Kanel, N.R. 1993. Lorenz Curve and Gini Coefficient: Conceptual Considerations. *The Economic Journal of Nepal*. 16(4):221.
- Kuznets, S. 1995. Economic Growth and Income Inequality. *American Economic Review*, March 1995, pages 1-28.
- Lim, A.S.K. and K.K. Tang. 2007. Human Capital Inequality and The Kuznets Curve. *The Developing Economics*. 46(1).
- Londono, J.L. 1990. Kuznetsian Tales with Attention to Human Capital. Paper Presented at the Third Inter-American Seminar in Economics, Rio de Janeiro, Brazil.
- Meier, G.M. and J.E. Rauch. 2007. *Leading Issues in Economic Development*. Oxford University Press, pages 187.
- Ram, R. 1990. Educational Expansion and Schooling Inequality: international evidence and some implications. *The Review of Economics and Statistics* 72(2).
- Thomas, V., Y. Wang and X. Fan. 2001. Measuring Education Inequality Gini Coefficient of Education. Pages 1-12 and 19 in Policy Research Working Paper 2525. The World Bank, Washington D.C.
- 2002. *A New dataset on Inequality in Education: Gini and Theil Indices of Schooling for 140 Countries, 1960 – 2000*. World Bank, Washington D.C. Pages 4.
- Todaro, M.P. 2000. *Economic Development*. Addison Wesley, New Delhi. Pages 319.
- World Bank. 2008. *The Road not Traveled: Education Reform in the Middle East and North Africa*. The World Bank, Washington D.C. Pages 17.