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DO HIGHER LEVELS OF SCHOOLING LEAD TO HIGHER RETURNS TO EDUCATION IN NIGERIA?

AMAGHIONYEODIWE, Lloyd Ahamefule*
OSINUBI, Tokunbo Simbowale

Abstract

The study found that completed years of schooling and experience were to large extent important variables that influenced earnings both in terms of parameters' significance, direction and magnitude. Wage returns to additional years of schooling completed increased as the level of education increases, thus, the higher the level of education the higher the rate of return to the individual. Also, only the post-schooling years for higher education impacted relevantly in terms of direction and magnitude on earnings of the concerned individuals.

JEL Classification: C51, I2, O55
Keywords: Returns to Education, Schooling in Nigeria

1. Introduction

Over the past three decades, Nigeria has made large public investments in education. In the 1970s the Universal Primary Education program (UPE) was introduced in Nigeria. Public expenditure was increased on primary education and this resulted in sharp increases in primary school enrollments. Gross primary school enrollment, which was 44 percent in 1970, rose to 109 percent in 1980. Secondary school and post secondary school enrollment also increased from 5.2 percent and 0.5 percent, respectively, in 1970 to 18 percent and 2.7 percent respectively in 1980. However, primary school enrollment ratio declined from 109 percent in 1980 to 82 percent in 1996/98, while secondary school enrollment ratio, remained at the 34 percent level it attained in 1985. Between 1980 and 1994, enrollment rates in post secondary schools rose from 2.7 percent to 4.3 percent and have since been increasing. This suggests that private investment in years of primary and secondary education has been declining while private investment in years of higher education has been increasing. Given the greater direct and opportunity costs of higher education relative to primary and secondary education, the economic value of the investment in education has been redistributed towards higher education.Also, it is widely observed that education is desired by families and by society for reasons other than simply its capacity to raise worker productivity. Human capital admittedly offers only a limited perspective on education, although one that can be quantified and monitored in the labour market over time, and contrasted between different levels of schooling and for different groups whose membership is fixed in the population. Accordingly, this study, using Mincerian earning model, investigated whether or not higher levels of schooling lead to higher returns to education in Nigeria? The paper is divided into four: Section two contains the literature review while section three examines the analytical framework and model. Section four is the empirical analysis and section five concludes the study.

* Lloyd Ahamefule Amaghionyeodiwe, Dep. of Economics, Faculty of Social Sciences, University of West Indies, Mona Campus, Kingston, Jamaica. Email: lamaghionyeodiwe@yahoo.co.uk and Tokunbo Simbowale Osinubi, Department of Economics, Faculty of Social Sciences, University of Lagos, Akoka, Yaba, Lagos, Nigeria. Email: tokunbosinubi@yahoo.co.uk

2. Economic Returns to Higher Education

In human capital theory, it is widely argued that any investment in human capital has a pure productivity element (Girma and Kedir, 2003). Similarly, the proponents see human capital as the stock of economically productive human beings (Babalola, 2000). Examples of such investments include expenditures on education, on-the-job- training, health and nutrition. Such expenditures increase future productive capacity at the expense of current consumption. Rosenzweig (1995) developed a framework for investigating the circumstances under which schooling improves productivity in the market and in the household, based on the notion that schooling enhances information acquisition. In his framework, it can be implied that the returns to schooling should be higher in regimes or economies in which there is greater scope for misusing an input, or when tasks are sufficiently complex that substantial learning is required to execute them sufficiently. Conversely, where tasks are simple and easy to master, schooling should have little influence on productivity. Furthermore, schooling returns are not necessarily augmented by the introduction of new technologies, if the new technology is relatively simple to use.

In his own study, Psacharopoulos (1994) found that primary education yields by far the highest private returns to schooling in least developed countries (LDCs). This finding was similar to those of Michaelowa, (2000) and Girma and Kedir, (2003). Michaelowa (2000) submitted that while private returns to education estimated in microeconomic studies give a clear indication of the positive impact of education for the individual, the interpretation of this result in terms of its overall economic relevance is ambiguous, and it remains difficult to provide clear evidence of the benefits of education at the aggregated level. While the theoretical relevance of human capital as a factor of production and a key to innovation and productivity gains is hardly questioned, empirical analysis fails to provide commonly agreed and reliable estimates of this effect. For developing countries such as, in particular, the low-income countries of Sub-Saharan Africa, it is even more difficult to give an indication of the impact of the education on productivity and growth. There are good reasons to believe, for instance, that given the highly untransparent and inefficient political and economic systems of many of these countries, much of the private returns to education are achieved through non-productive activities. This means that in order to increase the relevance of education for economic growth, it would be necessary to undertake a restructuring of the political and economic framework. Bourne and Dass (2003) in their study of private and social rates of return to higher education in science and technology in a Caribbean economy, Trinidad and Tobago, conclude that there exist considerable divergences between social and private rates of return, which raise two issues. One issue is whether the differences in rates of return among disciplines reflect differences in market demand and employment prospects. The second issue concerns the justification for fiscal subsidies reduction and differential for university education and among the disciplines. Harmon *et al* (2000) argue that the estimates of returns to education reflect not just the productivity enhancing effect on earnings of the underlying ability that education signals. This idea stems from work by Spence (1974); further formalized by Stiglitz (1975) and Riley (1975). Thus, the primary role of education is to signal to employers as to enhance the productivity of an individual. However, there is a fundamental difficulty in unraveling the extent to which education is a signal of existing productivity as opposed to enhancing productivity: they both suggest that there is a positive correlation between earnings and education, but for every different reasons (Harmon *et al.*, 2000). Despite the numerous studies on earnings and schooling in both

developed and developing countries, findings have been inconclusive as to which level of education generates the highest level of returns. This might be related to the ability bias and the measurement error experienced by the various approaches used in estimating these returns to schooling.

3. Analytical Framework and Model

The analytical framework for returns on higher education in Nigeria follows from the work of Mincer (1974), which has witnessed "modification and extension" in the hands of Johnson and Chow (1997); Hammermesh and Biddle (1998); Aromolaran (2002) and Clark (2000). According to Mincer (1974), the rate of return to schooling is the proportional increase in earning per year of schooling if schooling and schooling level are independent and if the costs of foregone earnings are schooling's only costs. This definition is based on human capital investment model, in which an individual is assumed to make a human capital investment decision in such a manner as to maximize the discounted present value of future earnings, given the opportunity cost of time and goods spent acquiring such capital, and the rate of interest (Becker, 1964). Thus, following Becker's work, there is assumption that education, s, is chosen to maximize the expected present value of the stream of future incomes, up to retirement at date T; net of the costs of education, C_s. Therefore, at the optimum, s, the Present Capital Value (PV) of the s^{th} year of schooling just equals the costs of the s^{th} year of education; equilibrium is characterized by:

$$PV = \sum_{t=1}^{T-S} \frac{W_s - W_{s-1}}{(1+r_s)} = W_{s-1} + C_s$$

Where r_s is called the internal rate of return (assuming that *s* is infinitely divisible, for simplicity, so "year" should not be interpreted literally). Optimal investment decision would imply that one would invest in the s^{th} year of schooling if $r_s > i$, where *i* is the market rate of interest. If T is large, then the right hand side of the equilibrium expression can be approximated so that the equilibrium condition becomes

$$\text{A=} \frac{W_s - W_{s-1}}{r_s} = W_{s-1} + C_s \qquad r_s \approx \frac{W_s - W_{s-1}}{W_{s-1}} \approx \log w_s - \log w_{s-1}$$

Then, if C_s is sufficiently small, we can rearrange A to give the last expression for r_s. This means that the return to the s^{th} year of schooling is approximately the difference in log wages between leaving at *s* and *s*-1 period of time.

The Model: Following the theoretical foundation, it is evident that years of schooling or education is a key explanatory variable in wage or earning function. And in order to understand the relationship between schooling and earnings, we thus, specified and estimated a modified Mincerian earnings function as contained in Okuwa (2004). Here we regresses the natural logarithm of the monthly wage rate (LnY) on education and experience with the education broken into a set of dummy variable representing different educational levels. The model is specified thus:

$$LnY = \alpha_0 + \alpha_1 CoE + \alpha_2 Pol + \alpha_3 Uni + \alpha_4 Ex + \alpha_5 Ex^2 + e \qquad (1)$$

Where: LnY = the natural logarithm of the monthly wage rate; CoE = Dummy for College of Education graduate; Pol = Dummy for Polytechnic graduate; Uni = Dummy for University graduate;Ex = Labour Market Experience;Ex^2 = Square of Labour Market Experience; e = Stochastic error term;

Following the assumptions on the possible channels of attaining higher education in Nigeria as contained in the section on sequence of higher educational levels in Nigeria, equation 1 was re-specified as:

$LnY = \alpha_0 + \alpha_1 Pry + \alpha_2 Sec + \alpha_3 CoE + \alpha_4 Poly + \alpha_5 Uni + \alpha_6 Ex + \alpha_7 Ex^2 + e$ (2)

Where:

LnY, CoE, Poly, Uni, Ex, Ex^2 are as defined above; Pry = Dummy for Primary education graduate; Sec = Dummy for Secondary education graduate;e = error term

Note that the influence of schooling is separated from the influence of experience. The coefficient of the constant term represents the entry-level wage to a new labour market entrance with a lower education or no schooling while the coefficients of dummies capture the marginal wage effects and are used to compute the return to their level of education. The coefficients of the experience variable are intended to capture returns to on-the-job training (experience), which is assumed to be non-linear because of diminishing marginal returns to increased on-the-job training and rising marginal cost of further training over time. It is expected that: $\alpha_0, \alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5, > 0$ and $\alpha_{6<0}\, \alpha_{7<0}$

The estimated rate of return to an additional year of schooling is obtained by dividing the difference between the coefficients of adjacent groups by their differences in years of schooling. To obtain this, Equation 2 was used thus:

$$R_{coe} = \frac{\alpha_3 - \alpha_2}{S_{coe} - S_{\sec}} \qquad R_{poly} = \frac{\alpha_4 - \alpha_2}{S_{poly} - S_{\sec}} \qquad R_{Uni} = \frac{\alpha_5 - \alpha_2}{S_{uni} - S_{\sec}}$$

Where S = number of years of schooling of the subscripted educational level

As stated earlier the above model is based on the work of Mincer (1974) and it has become the dominant procedure in estimating private rate of return to education. The use of dummy variable method rather than the years of schooling squared method adds a great deal of sensitivity to the result of private rates of return.

4. Data and Findings

Table 1 shows the mean monthly earnings by educational level, sex and sector. The table indicates that earnings of workers increase with more years of schooling irrespective of the sex of the worker and the sector in which the worker works. For instance, the mean monthly earning for Nigeria College of education graduates for all workers is ₦3880.37, this is ₦5330.01 and ₦9133.02 for polytechnics and universities, respectively.

Table 1: Mean Monthly Earnings by Educational Level by Sex and Sector (1995)

	Primary	Secondary	College of Education	Polytechnic	University
Overall	2196	3279	3880	5330	9133
Male	2366	3569	3740	5182	9864
Female	1611	2735	3982	5686	6637
Public Sector	2312	3530	2990	4312	6529
Private Sector	2100	3067	2865	4955	8967

Source: Labour Market Survey 1995 as reported in Okuwa (2004)

With respect to sex, the earnings show a slightly different pattern. That of male graduates soars from 4.8% for those of college of education to 38.6% and 90.3% for those of polytechnics and universities. The earnings differentials associated with schooling for females stood at 45% for college of education and 42% for polytechnic. This plummeted

to 16.7% for university graduates. Also, female graduates of college of education and polytechnics earn on average slightly more than their male counterparts with 6.1% and 8.9% respectively. While a very wide divergence existed in the male-female mean earnings for university with the male having an edge by 48.6% point. Also, the mean earning of those with lower education (primary and secondary) increased with additional schooling. The income differentials associated with schooling is contained in Table 2

Table 2: Monthly Earnings Differentials Associated with Schooling

	Secondary	College	Polytechnic	University$_1$	University$_2$	University$_3$
Overall	51.2	18.3	62.5	178.5	71.4	135.4
Male	50.9	4.8	45.2	176.4	90.3	163.7
Female	69.8	45.6	107.0	142.7	16.7	66.7
Public Sector	52.7	-15.3	22.1	84.9	51.4	118.4
Private Sector	46.1	-6.6	61.6	192.4	81.0	213.0

Source: Computed from table 11 as reported in Okuwa (2004). Notes: The column titled Secondary is the difference between the average earnings of a worker with primary education and average earnings of a worker with a secondary school education, as a percentage of the average earnings of primary school graduate. The column titled College is the difference between the average earnings of a worker with college-of-education education and average earnings of a worker with a secondary, as a percentage of the average earnings of secondary school graduate. The column titled Polytechnic is the difference between the average earnings of a worker with polytechnic education and average earnings of a worker with a secondary school education, as a percentage of the average earnings of secondary school graduate.The column titled University$_1$ is the difference between the average earnings of a worker with university education and average earnings of a worker with a secondary school education, as a percentage of the average earnings of secondary school graduate. The column titled University$_2$ is the difference between the average earnings of a worker with university education and average earnings of those with polytechnic education, as a percentage of the average earnings of secondary school graduate. The column titled University$_2$ is the difference between the average earnings of a worker with university education and average earnings of a worker with college-of-education education, as a percentage of the average earnings of secondary school graduate

Table 3: Returns to Education and Years of Schooling

Variables	Coefficients
Constant	2.053 (21.014)
Years of Schooling	11.024E-02 (31.024)
Experience	3.918E-02 (10.254)
Experience^2	-4.598E-02 (-7.985)
Gender	-1.333E-02 (-0.024)
Adj R^2	0.45
F-Statistic	172.69

"t" statistics are in parenthesis

The sector in which a worker is employed also affects earnings (Table 4). College of education graduates in the private sector earns more that their counterparts in the public sector. For the University graduates, the difference is more pronounced, those in the private sector earn more (about 37.0%) difference. and as the e is 37.0%. Also, earning differentials associated with schooling were moderate for all the three levels of education for those in the public sector while it widened for those in the private sector. Table 3 reports the estimated economic rate of return to an average year of schooling as 11.02 percent. However, the associated coefficient of the schooling years was positive and statistically significant. By implication, the observed rate of return to education shows that an additional year of schooling is compensated for by 11.02 percent increase in wage

of the individual. Also, an additional post-schooling year (i.e., experience) raises wage by 3.92 percent. These findings were similar to those of other studies like Nasir and Nazli, (2000) for Pakistan and Johnson and Chow, (1997) for China. With respect to each level of education, table 4 indicates that among the three levels of education under examination, only the coefficient of post-secondary education dummy is found to have the expected sign (i.e., positive) and statistically significant, whereas that of primary education dummy is found to be statistically significant with the wrong sign. This implies that post-secondary educational attainment, on average, raises the earning(s) of the concerned workers by about 15 percent. Furthermore, it can be observed from table 3, that secondary and tertiary education impact positively on workers' earnings. The economic implication of these results is that one additional year of schooling at the level of education associated with the said percentages, raises workers' earnings by the same proportion.

Table 4: Returns to Education and Level of Education

Variables	**Coefficients**
Constant	8.003 (31.711)
Primary	-1.124 (-1.241)
Secondary	-1.012 (-1.002)
College of Education	7.852 (21.0254)
Polytechnic	6.284 (15.231)
University	10.294 (23.468)
Experience	3.414E-02 (9.254)
Experience^2	-4.001E-02 (-6.191)
Gender	-.334E-02 (-0.002)
Adj R^2	0.55
F-Statistic	672.69

"t" statistics are in parenthesis

Table 5: Private Rate of Return to an Additional Year of Education (%)

	Male	Female	Public	Private	Total Sample
Secondary	1.2	4.4	2.1	3.2	1.5
College of Education	8.1	11.25	6.1	11.3	13.01
Polytechnic	11.6	7.9	10.3	15.6	11.03
University	18.9	11.2	15.4	21.5	18.02

Source: Computed using the rate of return specified in the model.

With regard to the private rate of return, table 4.5 shows that it increases as the level of education increases. In general it was quite high for graduates of polytechnics and higher for universities graduates. This result applies to all categories of the sample, whether you are a public or private worker and irrespective of the sex of the graduate. But the rates of return were higher for male graduates than their female counterparts.

5. Conclusion

The completed years of schooling and experience were to large extent important variables that influenced earnings both in terms of parameters' significance and elasticity (that is, direction and magnitude). Wage returns to additional years of schooling completed increased as the level of education increases. In other words, returns to primary education are the lowest while those of post-secondary or higher education were the highest. This implies that the higher the level of education the higher the rate of return

to the individual. Also, only the post-schooling years for higher education impacted relevantly in terms of direction and magnitude on earnings of the concerned individuals. This paper showed that higher level of education has benefits associated with it. Higher level of education enhances the individual's experience in the labor market as well as increases his earnings. Thus, investment in education contributes to enhanced labor force productivity and enables individuals to become better citizens, in addition to being better workers.

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