PRIVATE ECONOMIC RETURNS TO EDUCATION IN NIGERIA:
A FURTHER UPDATE

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Disclaimer:

This document represents part of the author's study programme while at the Institute of Social Studies. The views stated therein are those of the author and not necessarily those of the Institute.

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List of Acronyms

EA	Enumeration Areas
GHS	General Household Survey
HNLSS	Harmonized National Living Standards Survey
NASS	National Agricultural Sample Survey
NBS	National Bureau of Statistics
NDE	National Directorate of Employment
NLSS	Nigerian Living Standard Survey
OECD	Organisation for Economic Cooperation and Development
UNESCO	United Nations Educational, Scientific and Cultural Organisation
YOUWIN	Youth Enterprise With Innovation in Nigeria

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Abstract

In Nigeria, acquiring education has been looked upon as an escape route out of poverty for individuals, households, communities and the society at large. This paper examines this view by determining the private economic returns to education at various educational levels in the country in order to ascertain what level of education yields the highest economic returns to individuals. The study employs the Mincer earnings function using the Double Hurdle model estimation technique and distinguishes between tertiary education and post graduate education. This paper concludes that the highest rates of private economic returns to education arise from higher levels of education with post graduate education providing a significantly high rate of private economic returns to individuals.

Relevance to Development Studies

Providing and improving upon education is an important development strategy in many countries around the world. This study is relevant because it builds upon already existing studies on the returns to education by providing updated estimates of the private economic returns to education in Nigeria. Thus, it assists policy makers and education providers to know what types and levels of education to improve upon in order to increase the benefits of education to the individual, household and society.

Keywords

Private economic returns to education, Human capital theory, Schooling (Education), Earnings, Graduate un(der)employment

CHAPTER ONE

INTRODUCTION

1.0 INTRODUCTION

'Stop watching the television and wasting your life, go and read your school books so that you can pass your exams and get a good job when you are older' are words that most Nigerian children hear daily when growing up. This is often due to the belief of most parents that the way to success and good welfare (a well fulfilled life) is through education.

Over the years, many studies based on the human capital theory have emphasized the important role of education in a society. Blondal et al. (2002:42) note that a crucial incentive for individual investments in education is the improvement in capabilities which translates to possible increases in incomes. Furthermore, they observe that attaining higher levels of education is often a tool employed by people to 'gain a stronger foothold in the labour market' thus reducing the odds of being unemployed (Blondal et al. 2002:44). Some studies have further distinguished between the private returns to education and the social returns to education. Venniker (2000:47) opines that the disparities between 'private and social returns to education' spurs governments to contribute towards investments in education. Vedder (2004:677) writes that Governments encourage and invest in higher education partially on the assumption that higher education has 'positive externalities' thus giving rewards to not just the person who possesses it but to those around him/her. This implies that the skills which educated people have could improve the welfare and productivity of people around them as well as culminating in socio-economic development. Some of these positive benefits include lower crime rates, a healthier population and even possibly better democracy in governance as education helps produce a more informed and aware group of individuals in a society. However, Venniker (2000:47) points out that much more is known about the private returns to education than the social returns to education. In addition, studies such as Rosenzweig (1995) show the means via which education improves the livelihoods of people in a society. Rosenzweig (1995) proposes two channels through which education improves productivity in the household and in the market based on the presumption that education augments the attainment of knowledge. These include 'improving access to information sources such as newspapers…or by improving the ability to decipher new information from personal experience or from external sources…' Rosenzweig (1995:153).

However, the picture of education to some, is not very 'rosy' in Nigeria as some national newspapers like the Guardian (2013) reported that based on the December 2008 report of the Federal Ministry of Youth Development (a national body in charge of youth affairs), there were about

> 4.5 million entrants into the labour market with one million people out of the school system, 2.2 million primary school leavers not proceeding to secondary school, one million secondary school leavers not proceeding to the tertiary level and 300,000 tertiary graduates (The Guardian 2013)

with no access to formal sector jobs. With so many unemployed graduates, it seems that there is a divergence between graduate training and obtainable work.

The Guardian (2013) paper further reports that various employment and empowerment programs initiated by successive governments (particularly at the national level) in the past in coalition with the private sector have been tied to 'political partisanships' and also reactionary in approach to the problem of unemployment. Some of these schemes include the establishment of the National Directorate of Employment (NDE) in 1989, and the Youth Enterprise With Innovation in Nigeria (YOUWIN!) among others.

The Nigerian educational system has experienced different stages of restructuring over time. Yekini (2013:28-29) traces these stages- the first stage was in 1981 with the 6-5/7-4/6 system i.e. six years of primary schooling, 5 to 7 years of school education after primary schooling which gave an individual the option of enrolling into secondary school, colleges for teacher training or sixth form and 4 to 6 years of tertiary education in either a college of education, a polytechnic or a university. This was later translated in 1985 into the 6-3-3-4 system in which 6 years are for primary school education, 3 years for Junior Secondary School, 3 years of Senior Secondary school education and 4 years of tertiary schooling. The Education reform of 2006 introduced the 9-3-4 system in which the previous four categories were reduced to three, with the first two categories of the previous system (primary school and junior secondary school) combined and this new category of education became mandatory. The first 9 years is referred to as Universal Basic Education and this is compulsory, the next 3 years is for the senior secondary school followed by a minimum of four years in the tertiary institutions.

In Nigeria, the process of schooling[1] has become more of a ritual and there is a 'qualification-acquisition craze' in which people go through all manner of ways, some of which are 'backdoor'[2] in order to gain higher qualifications so that they can be better positioned for formal sector jobs. It is also a form of status to have 'graduates in the family' and so parents borrow and engage in many informal jobs in order to be able to send their children to school.

This study aims to contribute to the reassessment of the assumption of higher returns to schooling and contribute to knowledge and policy.

1.1 DEFINITION OF PROBLEM

The Ogundari and Aromolaran (2013) study based on 2003/2004 Nigeria Living Standards Survey (NLSS) data on returns to schooling indicates that higher levels of schooling lead to higher levels of earning. However, with recent reports asserting high levels of un(der)employment for university graduates, it is necessary to assess if their findings still hold true in Nigeria. Therefore, this study determines this by using a similarly structured General Household Survey (GHS) data of 2010/2011 and furthermore, a study using the same empirical techniques as the study aforementioned.

1.2 RESEARCH OBJECTIVES

This study seeks to

- Ascertain the consistency between the conclusions of the past 'returns to schooling' study conducted by Ogundari and Aromolaran (2013) and the current study using similarly constructed data.
- Establish whether differences still exist in returns to schooling at different levels of educational attainment.

1.3 RESEARCH QUESTIONS

Main Question

1. Have recent circumstances in Nigeria led to changes in the nature of economic returns to schooling?

[1] In this study schooling and education are used interchangeably

[2] Local slang for a shady method of doing things

Sub Questions

a) Are there differences in returns to schooling at different levels of educational achievements in Nigeria?

b) Are there any disparities between studies based on 2003/2004 NLSS data and this study which is based on 2010/2011 GHS data?

1.4 METHODOLOGY

The work of Mincer (1974) estimates returns to education by relating the increase in earnings per year of schooling to the level of schooling. This has been widely used by studies (such as Ogundari and Aromolaran (2013), Amaghionyeodiwe and Osinubi (2007), Oosterbeek and Ophem (2000)) to estimate the private rate of economic returns to education. This study utilizes the Mincer earnings equation as employed by Ogundari and Aromolaran (2013) to determine the differences in returns to schooling at various levels of schooling.

The model employed by the study is a standard Mincer earnings function

$$E_i = \psi_0 + \beta_i Ed_i + \alpha_i x_j' + \tau_i \quad (1a)$$

which is extended to

$$E_i = \psi_0 + \sum_{k=1}^{K} \beta_{ik} D_{Edlevel(k)} + \sum_{j=1}^{J} \alpha_{ji} x_j' + \tau_i \quad (1b)$$

Where E_i is the logarithm of earnings, Ed represents the years of schooling and x_j represents a vector of other control variables (social, economic and demographic variables). β_i measures the effect of education on income from the labour market which is popularly known as the private returns to education and α_i are the parameters to be estimated, while τ_i is the random error of the regression (Ogundari and Aromolaran 2013:5).

For the expanded form of the model $D_{Edlevels}$ is a dummy representing the different levels of educational achievement obtainable in Nigeria such as non-western education, primary, secondary, tertiary and post graduate education with no-schooling as the reference level. The study factors in the non-western form of education as there are some individuals who attend Quranic schools. However, it should be noted that because the levels of education are represented by dummy variables, the resulting estimates of β_{ik} cannot be analyzed as 'a direct measure of the economic returns to education' (Ibid.:5).

The Ogundari and Aromolaran (2013) study and by extension this study estimated the earnings function for household heads in their sample and consequently their private economic returns to education based on the premise that their earnings from the labour market is an indication of household economic welfare. It is important to note that the earnings function is restricted by its composition as there are a number of household heads that are sampled who are unemployed and thus report zero earnings. As following the study, I use the double hurdle model which is more flexible than the Tobit model because it acknowledges that both the decisions to engage in the labour market and the amount of income earned by an individual may not be generated by the same process as compared with the Tobit model which assumes that they are, hence the double hurdle model allows for these two 'hurdles' to be crossed i.e. the decision to participate in the labour market and consequently in earnings that accrue and secondly, the amount of earnings received (Cragg 1971:829,831).

According to Ogundari and Aromolaran (2013:6) An advantage of the double hurdle model over the Heckman (1979) model is that it allows for the occurrence of 'zero observation in the second stage' (determination of earnings received) to occur for reasons other than the sample selection

problem. Therefore, a zero observation could occur for reasons such as the predisposition of the respondent not to work, the unemployment status of the respondent among others (Loc.cit.). Furthermore, the double hurdle technique appears to be more relevant for analysis in a developing country like Nigeria since it allows for zero earnings (no incomes) from the labour market to households.

The double hurdle model as estimated by Ogundari and Aromolaran (2013) is presented below

$$d_i^* = \varsigma_0 + \sum_{k=1}^{K} \Omega_{ik} D_{Edlevel(k)} + \sum_{q=1}^{Q} \delta_{qi} m_q + \zeta_i \quad d_i = \begin{cases} 1 & \text{if } d_i^* > 0 \\ 0 & \text{if otherwise} \end{cases}$$

$$E_i^* = \psi_0 + \sum_{k=1}^{K} \beta_{ik} D_{Edlevel(k)} + \sum_{j=1}^{J} \alpha_{ji} x_j + \tau_i \quad E_i = \begin{cases} E_i^* & \text{if } d_i^* > 0 \,\&\, \mathrm{E}_i^* > 0 \\ 0 & \text{if otherwise} \end{cases} \qquad (3)$$

where d_i* is the latent variable representing first hurdle, that is the preference of household heads as to engage in the labour market (and thus earn wages), d_i is the observed variable affiliated with d_i*; $D_{Edlevel}$ is a dummy variable for the various levels of schooling theorized to determine the first hurdle. This includes education dummies representing the highest level of schooling attained by household heads such as non-western (religious education), primary, secondary, tertiary and post graduate education with the reference level as no schooling. In order to control for certain household characteristics, $m`i$ is a vector of households' social, economic and demographic variables which include the age of the household head, household size, gender dummies (of the household head), household head occupation dummies and location dummies (for households in the rural and urban areas and the regions in the country) theorized to explain the first hurdle (Ogundari and Aromolaran 2013:7).

E_i* is the latent variable expressing the second hurdle and is the real monthly income of the household heads, Ei is the observed variable related to E_i*; $x`i$ is a vector of socio-economic and demographic characteristics of the household heads that could determine the second hurdle, and are similar to $m`i$ of the first hurdle $\varsigma_0, \psi_0, \Omega ik, \delta$ and β are parameters to be estimated and ζi and τi are random errors of the regressions (Ibid.:8).

Li and Luo (2004:4) note that if the returns to schooling are high, a person is more likely to engage in higher levels of schooling and as there is a positive relationship between ability and the marginal returns to schooling, 'optimizing behaviour creates a positive correlation between ability and schooling.' However, not accounting for the ability[3] of the individual creates an upward bias i.e. it overestimates the economic returns to education, therefore a second earnings function was estimated to control for ability bias and based on the study of Li and Luo (2004), the highest educational level of both parents of the household head were included as control variables based on the assumption that a parent's education level is correlated with an individual's ability.

The above model is used to show whether the results from this study are consistent with that of Ogundari and Aromolaran (2013) which concludes that returns to education at post-secondary levels are significantly higher than returns to primary and secondary levels. Furthermore, it shows what level of schooling attained by household heads produces the highest economic returns and thus has the greatest effect on household welfare.

[3] Ability is an unobservable individual characteristic and thus cannot be directly measured, however it is possible to control for its effect using certain variables that are assumed to be correlated with an individual's ability for e.g. parental education

1.4.1 DATA SOURCES

The data used in this study is obtained from the General Household Survey of 2010/2011. This survey was conducted by the Nigerian National Bureau of Statistics in collaboration with the World Bank.

1.5 SCOPE AND LIMITATIONS OF STUDY

Weaknesses in the methodology arise from the fact that the earnings equation does not control for the years of experience in the labour market of the individual and therefore the results of the private economic returns to education may be overestimated. The Mincer earnings functions estimated do not capture all the sources of income that the respondents have access to since the study only acknowledges for the main job that the respondents reported. Also, the conclusions drawn depend on the quality of data used.

CHAPTER TWO

THEORETICAL AND CONCEPTUAL PERSPECTIVES

2.0 HUMAN CAPITAL

According to the OECD (1998:9) Human capital may be defined as 'the knowledge, skills, competences and other attributes embodied in individuals that are relevant to economic activity'. Ahmad and French (2011:127) write that the 'accumulation of human capital via education or learning is a key determinant for achieving perpetual economic growth.' The human capital theory is based on the endogenous growth theory which acknowledges that investment in knowledge has a substantial and positive effect on economic growth and development. The endogenous growth theory also postulates that investments in human capital accumulation leads to technical progress and therefore treats technical progress as endogenous as opposed to earlier growth models like the Solow growth model which took technical progress as exogenously determined.

In their study, Ahmad and French (2011:130) present a production function in order to establish the endogenous relationship between human capital and income. It is as follows

$Y= f (K, LH)$ (1)
where Y represents output, K represents capital, L represents the labour force, H stands for educational attainment, hence LH denotes a human capital adjusted measure of the labour force.

$K = K/L = K/Y * Y/L$ (2)
implying that per capita capital (k) which is derived from K/L can be expressed as the above.
K/Y represents the capital output ratio which is assumed to be constant in the steady state.

$y = Y/L = f (k, LH/Y)$ (3)
The per capita output ratio can be expressed as shown above (equation 3) indicating that per capita output has a functional relationship with per capita human capital stock adjusted labour.

Human capital theory assumes that an individual's knowledge is commensurate to his/her level of formal education and proposes that a high amount of schooling leads to greater individual and societal productivity and growth at the aggregate economic level (Livingstone 1997:9). At the level of individual productivity, the human capital theory postulates a correlation between the amount of human capital that an individual has accumulated over time and the level of income that the individual receives. In the same vein, the productivity of an educated individual as reflected in type and quality of output that he/she produces is expected to be better than that of an uneducated or less educated individual. Additionally, societal productivity is theorized to improve based on the summation of all the human capital in individuals in the society thus translating to economic growth and socio-economic development. Human capital and physical capital are thought to be complementary in the growth process as Schultz (1961:2) notes that if 'human capabilities do not stay abreast of physical capital, they become limiting factors in economic growth.' When employed by itself, physical capital experiences diminishing returns in the long run and this is indicated by a fall in output, however, when augmented with human capital, there arises the occurrence of increasing returns to production. Furthermore, human capital 'enhances productivity' (Lucas 1988:39) and influences allocation of income in an economy via the labour market (Blondal et al. 2002:42). This is based on the assumption of a perfectly functioning market in which the forces of demand and supply allocate wages to labour (individuals) based on their varying productivities. In the same vein, Pissarides (2000:8) writes that the 'structure of the labour market' influences the type of human capital that is produced in an economy, and also the private returns to human capital (Grootaert 1990:317). This suggests that in an economy whose labour market thrives on the informal sector such that the skills learnt and transmitted are geared towards the enhancement of

the informal sector, the returns to informal education would be greater than the returns to formal education. There are different ways of measuring the human capital stock in an economy, however, a more direct method of measuring the stock of human capital (obtained via education) in an economy is by using the education attainment levels of individuals as compared with using enrollment rates (Barro and Lee 2000:2); also, this data is easily available for analysis (OECD 1998:30).

Investing in human capital involves forfeiting current consumption in order to augment 'future productive capacity' (Amaghionyeodiwe and Osinubi 2007:160), furthermore, it increases the possibilities accessible to individuals (Schultz 1961:2). Both the public sector (Governments) and the private sector (individuals) can invest in human capital accumulation- Governments can do this through subsidizing tuition fees as well as offering scholarships. Also, private households can invest in education from their savings. The United Nations Educational, Scientific and Cultural Organisation (UNESCO) recommends that governments spend about 26 per cent (26%) of their annual budgets on education in order to develop their human resource capacity. Education is an important means to acquire human capital and the level of human capital an individual possesses plays an important role in an individual's earning capacity (Keeley 2007:21). This seems to suggest that the human capital theory implicitly assumes that the idea of meritocracy holds i.e. that highly skilled individuals (based on their education and learning) are always rewarded as indicated by their income levels. According to Blondal et al. (2002:50) certain policies like Progressive income taxes discourage human capital investment because the tax rates levied increase as the earnings of an individual increase while policies like public subsidies for education encourage human capital investment since it reduces the economic cost (in terms of tuition fees) to individuals. The institutions in an economy play a significant role concerning the returns to investments in education (Rosenzweig 1995:153) so also the social returns to investments in education as Amaghionyeodiwe and Osinubi (2007:160) note that those in Sub Saharan Africa need to be restructured in order to allow for the theorized positive effects of education on enhanced productivity and increased growth to emerge as their present inefficient nature creates distortions. Investment in and accumulation of human capital is perceived as a way in which developing economies can 'catch up' with more advanced economies because they often have large populations and thus an abundance of potential human resources which can be transformed through education into productive inputs in the production process culminating into rapid economic growth. Moreover, in the present, globalized world which is knowledge driven, education and particularly higher education is viewed as a critical tool for developing economies. In the same vein, Pillay (2011:3) writes that individuals with higher education have better prospects of creating new forms of technology and building up better skills than were available in the past.

On the other hand, Kerr and Teal (2012:15) conclude that human capital theory is useful for analyzing the disparities in private sector earnings in South Africa but not in the public sector. Wolf (2010:575) notes however that this could be because income in the public sector is not dictated by the market but are usually fixed by the government. Although the human capital theory postulates that higher education improves an individual's productivity as indicated by his/her earnings, the positive correlation between schooling and earnings could be a form of signaling i.e. education could be an indication of an individual's inherent ability (Fleischhauer 2007:16). This implies that individuals with more superior abilities who have acquired more education can use their higher degrees or certification to signal their latent abilities to potential employers and consequently earn higher wages. Furthermore, Vedder (2004:684) writes that higher education could be a 'screening device rather than a creator of human capital' i.e. it reduces the costs for employers in searching for employees and therefore, a higher educational degree is used as a criterion in selecting employees. Nevertheless, Boissiere et al. (1985:1029) conclude that the disparities in earnings is attributed to the human capital hypothesis. Pissarides (2000:9) observes that the human capital theory does not acknowledge that 'higher rate of private returns may arise

from rent seeking activities and not growth enhancing activities.' This is based on the notion of rent seeking behaviour particularly in the public sector such that an increase in the allocation of human capital to the public sector may not be creating growth opportunities but may just be a form of redistributing already created wealth. More so, Bowles and Gintis (1975:75) argue from a Marxian stance that the human capital theory is deficient because it does not provide a theory of reproduction and ignores the social relations involved in the production process focusing instead on the technical relations between the factors of production. They note that considering the relationship between individuals and wages based on the institution of the labour market overlooks a key phenomenon in the capitalist system which is the power relations between the capitalist and the worker. Patrinos et al (2006:2) also warn that increasing investments in education could give rise to an increase in economic inequality if the private economic returns to education diverge considerably across the income distribution in an economy i.e. if the private economic returns to education are greater for people who are already at the higher end of the revenue distribution.

2.1 WHAT ARE RETURNS TO SCHOOLING?

This section looks at the concept of schooling, motives that influence schooling decisions as well as the concept of returns to schooling and the various types of returns to schooling.

2.1.1 SCHOOLING/EDUCATION

According to Psacharopoulos (1990:160) Education is a 'basic human right' and is necessary for the development of an economy, furthermore, it enables a society to 'participate in the global knowledge economy' (World Bank[4] 2000:16). Education is widely recognized as a key factor in promoting social and economic development within countries such that the Education index is a component in measuring the Human Development Index (HDI). Alstadsæter (2011:460) distinguishes between the motives that individuals have for acquiring education and these are the consumption motive and the investment motive. The investment motive is the most common motivation as it involves an individual increasing their stock of education based on future wage expectations in order to compensate for current costs that are incurred while schooling whereas the consumption motive for education involves people who possess superior innate abilities engaging in specific types of education which gives lower compensation to them in relation to their skills e.g. teaching (Alstadsæter 2011: 459-461). The consumption motive is more prevalent in more advanced economies that have social safety nets for the general population such as subsidies for utilities consumption as well as generous scholarships for education. In addition, the investment motive is linked with the notion of private economic returns to education because it involves an individual making a decision to delay present earnings in favour of acquiring more education with the anticipation of earning a greater reward in the future. Also, schooling is influenced by a child's background because of the varying discount rates to education (Oosterbeek and van Ophem 2000:33). Children from better socio-economic backgrounds are more likely to get an education than children from less privileged backgrounds often because there is a greater opportunity cost for poor children as they are often involved in household economic activities.

[4] This report was compiled by the Task force on Higher Education and Society on behalf of the World Bank and UNESCO

2.1.2 RETURNS TO SCHOOLING

'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' (Mincer (1974) as cited in Amaghionyeodiwe and Osinubi (2007:161)). A decision to forego present earnings is based on the assumption that investment in human capital will lead to increased productivity and higher earnings in the future.

The economic rate of return to education can be measured based on a micro level analysis and a macro level analysis. The micro level analysis is measured at the individual level and measures the marginal increments to earnings from an increase in schooling while the latter measures the relationship between educational attainment and economic growth on an aggregate level (Fleischhauer 2007:10). Determining the rates of return to the acquisition of education at different levels is important as it contributes to improving the effective implementation at policies at the various levels of education (World Bank[4] 2000:40). The highest economic returns to education usually come from low-income and middle-income countries (Psacharopoulos and Patrinos 2004:112). This is likely to be a consequence of the scarcity of skilled, educated and highly paid labour in relation to unskilled and low paid labour with little or no education in low income countries as compared with higher income countries. Rosenzweig (1995:157) observes that there is a correlation between returns to schooling and 'returns to learning' and that in areas where the rewards to learning a new form of technology is high, then individual investments in training (schooling) will yield substantial dividends. Kahyarara and Teal (2007:2228) write that the rates of economic returns to education diverge among individuals based on how they advance through the educational system.

The concept of the rate of return has been criticized because it presumes that disparities in earnings are an indication of the different levels of productivity among individuals (Jandhyala 2007:84). Furthermore, with increases in unemployment and underemployment rates of educated people alongside increasing school enrollment rates, the notion of returns to schooling has suffered a setback (Livingstone 1997:9). Dalmazzo and De Blasio write that in order to adequately measure human capital externalities, it is necessary to examine the effect of human capital on not just wages but also on rents as the Mincer earnings equation undervalues the effect of 'human capital externalities on productivity' such that it may be presumed that there are no spillover effects of human capital (2005:359-360). In addition, Heyneman (1995:564) states that a weakness in the process of estimating the rates of returns to various educational levels is that it does not control for the interrelationships between the investment decisions involved at various levels of schooling. Teal (2011:59) observes that the private economic returns to education in Africa are convex in nature as opposed to results of Psacharopoulos (1994) which claimed that they are usually concave in developing countries. This is supported by Nsowah-Nuamah et al. (2010:9) who confirm this for Ghana and also in Tanzania (Rankin et al. 2010:12). This convexity implies that there are higher marginal economic returns to education for individuals with higher levels of education and lower marginal economic returns to education for people with lower levels of education. On the other hand, concavity implies that there are diminishing returns to education such that as an individual's level of education increases, the private and social returns to his/her education reduce; this supports the hypothesis that the greatest returns to education come from the primary level of education. Concerning equality in distribution of the economic returns to education, Patrinos et al (2006:16) argue that the private economic returns to education are more likely to be equally distributed among a population which has a low amount of human capital as compared to an economy with a higher amount of human capital whose reward system is already skewed in favour of some groups.

2.1.3 SOCIAL AND PRIVATE RATES OF RETURN

The OECD (1998:69) distinguishes between the private rate of return to education, the social rate of return to education and the fiscal rate of return to education. The private rate of return affects the individual's motives for acquiring more education- it is more direct in that it measures an individual's earnings as influenced by his/her level of education; the social rate of return has an effect on societal investments in education- this seeks to measure the external /spillover effects of investments in education on the general society and the fiscal rate of return measures how long it will take for the government to regain its investments in education (e.g. public subsidies for education) often through taxation. Blondal et al. (2002:59) define the private internal rate of return to upper secondary and tertiary education as the 'discount rate that equalizes the future flows of real benefits and real costs associated with investment in upper secondary or tertiary education.' Venniker (2000:48) notes that the anticipation of high private economic returns to education encourages individuals to increase their level of education. Alternatively, the social benefits consist of increased productivity in the general economy as well as non-economic benefits like reduction in crime levels (Blondal et al. 2002:64). However, the private returns to education in terms of higher earnings do not often equate the social returns to education (Pissarides 2000:32). It is easier to measure the private returns to investment in human capital than the social returns (i.e. the externalities to the general society) according to the OECD (1998:53). Psacharopoulos and Patrinos (2004:117) note that one of the reasons why so far, the estimated value of private rates of returns to education appear to be greater than the social rates of returns may be because it is difficult to measure the spillover effects associated with educating an individual.

2.2 GRADUATE UN(DER)EMPLOYMENT

This occurs when individuals are 'overqualified' for the jobs that they are engaged in and has become more prevalent in many societies among the youth, it appears that there is a surplus of educated people in both developing and advanced economies. Livingstone (1997:11) states that 'the biggest challenge to human capital theory is underemployment of credentialled knowledge.' Sometimes, this problem is linked to the quality of schooling that an individual acquires i.e. individuals that acquire more superior education are less likely to be underemployed than people with inferior education, however, Livingstone (1997:12) argues that better forms of education and studying will not close the divergence between the number of educated people and the amount of jobs available and proposes that the solution to this problem will involve reforming economic policies. Al-Samarrai and Bennell (2007:1292) observe that self-employment has become a significant basis of livelihoods among secondary school leavers because of the limited job opportunities in the formal sector. Often, youths engage in alternate businesses (which are often informal in nature) while looking for waged employment. However, these businesses may not take proper advantage of the skills that educated graduates have developed through higher education and Schultz (1961:13) warns that the quality of human capital is likely to diminish when the skills that individuals have developed are not utilized effectively. Grootaert (1990:317) writes that the odds of increasing job opportunities in the formal sector in African countries is quite low. This is most likely due to inadequate economic and physical infrastructure such as capital markets as well as a poor investment climate that discourages large investments in the formal sector because of the risks involved in doing so. Blondal et al. (2002:50) however, write that 'high youth unemployment' could be a motivator for youths to acquire higher educational qualifications as this will reduce the risk of unemployment.

2.3 EARNINGS

Schultz (1961:14) writes that an individual's earnings depend on his/her investment in human capital via education. Earnings (otherwise referred to as income) refers to the rewards that individuals receive as a result of work done and their participation in the labour market as a factor of production. The human capital theory postulates that disparities in earnings among individuals and sectors depends on their productivities (Kerr and Teal 2012:2), furthermore, disparities in wages across different types of education occur because individuals with higher abilities engage in the fields of education that 'generate higher wage returns' (Alstadsæter 2011:458-459). These fields include engineering and other jobs related to the sciences, hence there are different rates of returns among different fields of schooling as the previously mentioned fields generate greater rewards as compared with fields of schooling related to the arts (Blondal et al. 2002:44). However, Kerr and Teal (2012:3) point out that disparities in earnings especially within the same sector for workers with similar traits could be because of the structure of the institution. This is to say that the system could be constructed in such a way as to favour one group of people over another usually based on factors that are little or in no way related to the worker's productivity for e.g. the race and in some cases, the gender of the individual. Concerning the presence of possible externalities to an individual's human capital, Lucas (1988:40) writes that if these exist then 'the wage rate of labor at any given skill level will increase with the wealth of the country in which he is employed' proposing that with unhindered migration between countries, the income levels within countries will increase culminating in a convergence in standards of living between developed and developing countries. In conclusion, there is a positive relationship between education and the possibility to earn more because education leads to the acquisition of 'knowledge and skills' and this raises productivity (Blondal et al. 2002:42).

2.4 FORMAL (WESTERN) AND INFORMAL (NON- WESTERN) SCHOOLING

De Sousa Santos (2006:14) writes that the western type of knowledge was spread across the world as a means of validating the advancement of capitalism simultaneously subduing other forms of knowledge and relegating them to an inferior position. In the same vein, Escobar (2007:183) argues that 'the power of Euro centered modernity…lies in the fact that is has produced particular global designs in such a way that it has "subalternized" other local histories and their corresponding designs.' In many previously colonized countries, the educational systems are designed based on the educational systems of their colonizers who are more often than not, western countries, thus there is a tendency that the western form of education which is looked upon as being more advanced becomes more popular. Moreover, it is this western, formal type of education that is often pushed by International organisations such as the World Bank and is encouraged by the human capital theory. Grootaert (1990) compares the rates of returns to individuals who engage in both the formal and informal sector in Cote d'Ivoire. The formal sector generally refers to 'white collar jobs' that is, jobs that are engaged in at offices and are 'modern' as opposed to informal 'blue collar jobs' which mainly involve manual labour. He finds that people with formal education have a higher probability of engaging in waged labour which he describes as a form of signaling to the employers (Ibid.:311). Furthermore, he reports that having an informal education has an insignificant effect on an individual's income while having a formal education has significant economic returns to the individual particularly from after the secondary level of education (Grootaert 1990:312). In addition, he notes that because both informal and formal systems of education are looked upon as being substitutes to the same objective which may be economic growth or increase in the level of personal income (private returns to investment in education), the informal system is seen as subordinate to the formal system, however an increase in government investment in the informal sector may translate to greater opportunities for individuals in that sector and returns to informal education are likely to increase (Ibid.:318).

CHAPTER THREE

PRESENTATION OF DATA

3.0 COUNTRY CONTEXT

There are two major forms of education in Nigeria -the formal and the informal. Formal education refers to the western style of education beginning from the primary level of education to the post graduate level of education while the informal refers to 'primitive' and traditional ways of learning and are more prevalent in rural areas. The Nigerian formal educational system is designed according to the British educational system as Nigeria is a former British colony; in the formal system, education is transmitted in the English language and this system is generally more popular across the country. Investment in human capital through education is undertaken by all tiers of Government (Federal, State and Local Governments) and private individuals. Traditionally, the Federal and State Governments are charged with the provision of secondary and tertiary schooling while the local Governments provide primary schools, however the Universal Basic Education program is funded by the Federal Government. The costs of schooling are subsidized in the public schools i.e. tuition fees are subsidized and in some primary schools in some parts of the country, children are fed lunch. However, with the gradual decline in educational services rendered by the public sector, there has been a gradual shift towards the establishment of private schools owned by private individuals and organisations. This type of education is more expensive yet individuals that can afford it prefer to send their children to these schools because it is widely accepted that the quality of education obtained at private schools is better than that at public schools especially at the primary and secondary levels. Although, there are some disagreements as to what sector offers better quality of education at the tertiary level, in more recent times, there has been a steady increase in enrollments at private universities because of the strikes that seem to consistently occur at public universities. Amaghionyeodiwe and Osinubi (2007:159) observe that over time, 'the economic value of the investment in education has been redistributed towards higher education.' With the increase in enrollment rates at the various levels of education which has been encouraged by Government policies such as conditional cash transfers to primary school aged children among others, there has been a decline in the quality of infrastructure at schools. Furthermore, as a result of the low wages that teachers receive in comparison with other sectors of the economy and are often times owed, strikes have become a common phenomenon and this has also led to the depreciation in quality of education that is transmitted. In addition, the curricula in most schools are not updated leading to the transmission of obsolete knowledge. The typical dream of a young Nigerian is to go to school, graduate, get a well-paying job, get married, have children, send them to school in that exact order and so when there seems to be a disconnect between the period between graduating and getting a good job, there is a mental pause which on the socio-cultural front has resulted in late marriages as youths especially males 'have' to get a good job before they can settle down to marry. Young people acquire higher levels of education with the expectation that it will improve their chances of gaining higher paying jobs in the private sector especially in oil companies and high paying government agencies: this has led to a situation in which many people acquire higher levels of education not necessarily to enhance their productivity but as a 'ritual'. This expectation stemmed from the post-colonial era when technical manpower provided at the tertiary level was needed to manage the operations of the civil service and wages were greater in real terms, however with the explosion in the number of graduates and the shift in the nation's production base to the extraction of crude oil from agriculture which is capital intensive and has a low labour employment capability, there has been an increase in the incidence of graduate un(der)employment. Hence, in Nigeria, it is the investment motive that drives the choice of education type that individuals undertake as education is viewed as a direct source of livelihood of

the affected individual as well as the general household, therefore, it is quite normal to observe many not well to do households who train one child and bestow on that child the responsibility of training the other siblings and also contributing to the household's welfare.

3.1 PRESENTATION OF DATA

The data used for this study is drawn from the first wave (post planting) of the General Household Survey (GHS) - a panel survey conducted every 2-3 years by the National Bureau of Statistics, Nigeria (NBS) in collaboration with the World Bank. This wave of data was analyzed by this study because it contained a higher number of responses and thus observations for the key variables under consideration (i.e. labour market earnings and the level of schooling) than the second wave of the panel survey (post-harvest survey). The survey covers both rural and urban areas in all the 36 states of the Federation and also includes the Federal Capital Territory (Abuja). The General Household Survey (GHS) 2010 used a stratified multi-stage sample design (for further details on the methodology employed in selecting the sample population see Interviewer Instruction Manual of the General Household Panel Survey 2010). The panel survey covers 5,000 households and the first wave of data collection was carried out in August-October 2010. The questionnaire used for the survey was structured from the Harmonized National Living Standards Survey (HNLSS) and the National Agricultural Sample Survey (NASS). The 5000 households that were involved in this survey were made up of 10 households in 500 Enumeration Areas (EAs) and the number of Enumeration Areas in each state depended largely on the size of the state with Niger state (one of the largest states in terms of landmass) allocated 18 Enumeration Areas and Abuja (one of the smallest states in terms of landmass) allocated 4 Enumeration Areas.

As noted earlier, this study aims to determine the economic returns to schooling in Nigeria using the techniques employed by the Ogundari and Aromolaran (2013) study on returns to schooling and its influence on household welfare. Following their approach, this study focuses on the private economic returns to schooling of the household head. An inherent assumption is that the higher the returns to schooling for the household head, the greater the benefits that accrue to the members of the household and thus an improvement in household welfare.

Presented below are the household and individual characteristics that are controlled for in the estimated model

3.1.1 EARNINGS OF THE HOUSEHOLD HEAD

For this study, the earnings of the household heads were calculated in monthly units and transformed to natural log-form. This means that the reported income was adjusted to its estimated value per month, for example, for an individual who reported his annual salary, this figure was divided by twelve (12) to arrive at his approximate monthly income. As stated earlier, there are some members of the sample population who do not receive earnings for reasons such as their inability to find paying employment and also because they are apprentices and thus receive no payments. In the same vein, some members of the sample population that report zero earnings are from the agricultural sector and are unpaid for their labour. The sample population also includes household heads who earn wages (per hour/daily) and salaries (monthly/annually). Moreover, estimations were based on the basic earnings from the main job that the individual holds which is usually his/her highest paid job and does not include allowances or earnings from other economic activities the individual is engaged in for example, petty trading.

3.1.2 LEVEL OF EDUCATION

For this study, the level of education refers to the highest level of education that the household head has attained by the time of the survey. Dummies were constructed to represent the various schooling categories.

The term 'school' for the survey covers 'primary, secondary and post-secondary schooling as well as other intermediate levels of schooling in the formal school system' (NBS 2010:51). The categories of education in the Nigerian Educational system are as follows-

- Non Western Education- this category comprises of non-formal schools like Quranic schools which train young boys of primary school age under the tutelage of a Mallam (an expert in the Quran). This form of education also consists of religious schools which do not teach based on a full, standard western style school curriculum but on religious material.
- Primary Education- This is the level of education that is referred to as 'basic.' This stage is composed of six years of formal schooling in which participants are taught basic courses like Mathematics, English, Agricultural science etc. Upon successful completion, an individual is awarded the First School Leaving Certificate.
- Secondary Education- This is the next stage of formal schooling after primary school and consists of the Junior secondary school (3 years) and Senior secondary School (3 years). At the Senior Secondary School level, a participant can specialize in their field of choice i.e. the Arts , Sciences or Commercial Studies and this lays the foundation for tertiary education.
- Tertiary Education- this category is made up of Universities, Colleges of Education and Polytechnics.
- Post Graduate Education- this category consists of Post Graduate programs for e.g. Masters and Doctorate degrees.

The scope of this study does not cover vocational training or technical education.

3.1.3 HOUSEHOLD SIZE

Based on the line of thought that the household head is benevolent and that his/her economic returns to schooling affects the household's welfare in terms of the idea of 'more mouths to feed,' in determining the private returns to education for a household head it is important to control for household characteristics like the household size. In the sample, the size of the households range from one (1) to thirty one (31) with the most common household size at 5 people. For the survey, a household is defined to include all people who eat and sleep in the same dwelling for at least 6 months preceding the interview including servants (NBS 2010).

3.1.4 AGE OF THE HOUSEHOLD HEAD

In the survey, the household head refers to the person who makes the major decisions in the household and in the sample population the age of the household head varies from 20 years (youngest) to 110 years (oldest) with 40 years being the most common age for the household head.

3.1.5 OCCUPATION OF THE HOUSEHOLD HEAD

For the estimation, dummy variables were generated to represent the occupation of the household head. The types of occupation considered by the survey include-

- Professional/ scientific/technical activities
- Public Administration
- Buying and selling (Sales)
- Agriculture
- Transportation
- Manufacturing
- Personal Services
- Construction
- Education
- Financial services
- Education
- Health
- Mining
- Electricity

3.1.6 SECTOR

The sample population covers households (household heads) in both rural and urban areas and this is controlled for as the returns to schooling estimates may vary depending on the sector. The purpose of the GHS is to gain more information about agricultural households and these are more prevalent in rural areas, therefore it is not surprising that about 67.6% of the sample population is based in rural areas. Also dummy variables were generated to control for the sector that the respondent was in with the rural sector as the reference point.

3.1.7 ZONE

The sample population was selected from the seven (7) zones in the country and they include

- South South
- South East
- South West
- North East
- North West
- North Central

Dummy variables were generated to control for the location of the respondents.

3.1.8 GENDER OF THE HOUSEHOLD HEAD

A Gender dummy was generated in this study to control for the gender of the household head (i.e. either male or female). This is so as to control for personal characteristics of the individual.

3.1.9 PARENTAL EDUCATION (OF HOUSEHOLD HEAD)

Li and Luo (2004:197) note that there are two methods in the literature to adjust for the 'ability bias' and these are the Instrumental variable (IV) approach and the control variable approach. They explain that the control variable approach involves including variables in the earnings equation to 'purge or absorb the effect of unobserved ability on the relationship between schooling and earnings while the Instrumental Variable estimation is used as an instrument for the schooling level' (Li and Luo 2004:197). Furthermore, they note that the level of parental education is often used as both a control variable and an instrumental variable based on different assumptions. When used as a control variable, the basic hypothesis is that the educational level of the parents has a direct effect on the educational level of the children and therefore influences the productivity of the children, hence assuming that the parent's education level is correlated with their child's ability. On the other hand, when used as an instrumental variable, the presumption is that the level of education of a parent plays an influential role on the child's educational level but is not correlated with the child's ability (Ibid.:197). Controlling for ability bias accounts for the notion that people who possess greater ability tend to acquire more education, therefore these individuals with higher education who earn higher levels of income would have still earned as much even if they had a lower level of education, therefore, it is important to control for the ability effect or bias so that we can assert that the effect of education on earning is not affected by the ability of the individual. Without controlling for this effect, then the education estimates may be overstated or 'biased upwards.' However, if there exists an error in the measurement of schooling, using parental education as a control for ability does not correct for the measurement error (attenuation bias) while using parental education as an instrumental variable corrects for this type of error and also controls for the ability bias, therefore the difference in estimates from these two approaches depends on the relative sizes of the measurement bias and the omitted ability bias. So, if the bias as a result of the error in measurement is larger than the bias resulting from ability, the estimates from the Instrumental variable approach will be greater than the estimates from the control approach (Loc.cit).

In the sample, about 62% of household heads report that their fathers had no education and about 73% report that their mothers had no formal or non-formal education.

3.2 DOUBLE HURDLE ESTIMATION TECHNIQUE

As noted earlier, the Mincer earnings function (the economic returns to schooling) is estimated by a double hurdle model. The double hurdle model is estimated by maximizing the log-likelihood function. According to Cragg (1971:831), the first hurdle is represented by a probit model (which accounts for the probability of the household head participating in the labour market) and the second hurdle is be represented by a truncated regression model (this determines the amount of earnings received by an individual). Mullahy (1986:345) further explains that this implies that the incidence of a zero or non-zero outcome is decided by a binary probability model and if the outcome is non-zero and thus positive, its distribution is 'governed by a truncated-at-zero count model.' This allows for both decisions (hurdles) to result from different underlying data generating processes i.e. the decision to participate in the labour market is separated from the decision on how much the individual receives as earnings which may depend on market forces or the government. In addition, this process allows an individual's characteristics to affect both decisions independently and differently.

3.3 LIMITATIONS IN DATA COLLECTION

There were missing values for some individual and household characteristics possibly because of errors on the part of the interviewer as well as the refusal or inability of the respondents to answer certain questions concerning their age or their earnings. Also, it is probable that the respondents may have reported that they were unemployed when in reality they were underemployed.

The table below contains the descriptive statistics of the variables that are employed in the Mincer Earnings functions and the models to be estimated.

Table 1 - Descriptive statistics

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
Log of earnings	4915	4.91856	4.947965	0	14.15198
No Education	5000	.3252	.4684964	0	1
Non-west Education (Quranic)	5000	.0586	.234898	0	1
Primary Education	5000	.263	.4403065	0	1
Secondary Education	5000	.2162	.4116934	0	1
Tertiary Education	5000	.1084	.310916	0	1
Post graduate Education	5000	.0152	.1223599	0	1
Household Size	4991	5.520337	3.091902	1	31
Age	4980	49.57108	15.4689	20	110
Gender	4995	.1487487	.3558763	0	1
Unemployed	4999	.0002	.0141436	0	1
Agriculture	4997	.5095057	.4999597	0	1
Mining	4991	.0030054	.0547447	0	1
Manufacturing	4993	.0234328	.1512888	0	1
Professional/Scientific/Technical Activities	4996	.0230184	.1499769	0	1
Electricity	4997	.0040024	.0631441	0	1
Construction	4998	.0294118	.1689746	0	1
Transportation	4997	.0406244	.1974382	0	1
Buying and Selling	4994	.1119343	.3153172	0	1
Financial services	4991	.005009	.070604	0	1
Personal services	4989	.0605332	.2384959	0	1
Education	4991	.0362653	.1869682	0	1
Health	4992	.0136218	.1159264	0	1
Public Administration	5000	.0502	.2183793	0	1
Father's Educational level	4983	12.98776	19.59456	0	98
Mother's Educational level	4942	9.44395	18.10235	0	98
Rural/Urban	5000	.324	.4680468	0	1
North Central	5000	.16	.3666427	0	1
North East	5000	.16	.3666427	0	1
North West	5000	.18	.3842259	0	1
South East	5000	.16	.3666427	0	1
South South	5000	.16	.3666427	0	1
South West	5000	.18	.3842259	0	1

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF RESULTS

4.0 DIFFERENCES IN RETURNS TO SCHOOLING AT DIFFERENT LEVELS

In order to determine the economic returns to schooling at the various levels of schooling, the Mincer earnings function was estimated using the double hurdle model as proposed by Cragg (1971). For this study, four different specifications of the Earnings function were estimated. The first specification is estimated in the same fashion as the Ogundari and Aromolaran (2013) study and it includes all the household heads in the sample population and does not account for possible ability bias. The second specification however, controls for the ability of the household heads by controlling for the highest education level of both parents. The third and fourth[5] specifications restrict the estimation of the Mincer earnings function to the fraction of the sample population which is within the statutory working age limit in Nigeria which is 60 years; the third specification therefore does not control for ability among the restricted population while the fourth specification controls for the ability bias of household heads within the statutory age limit. These various specifications are estimated in order to determine if the estimates are upwardly biased because of the influence of an individual's ability, likewise, the Mincer earnings function is estimated on a restricted fraction of the labour market as a way of testing the robustness of the results so as to see if the results are consistent within the official recognized age range of the labour market as the total sample population includes household heads who are over 80 years old.

The table below shows the estimates of the Mincer Equation based on the Double Hurdle model of the private economic returns to education across all four specifications

Table 2 –Estimates of Private Economic returns to Education in Nigeria

	1st specification		2nd specification		3rd specification		4th specification	
Variables	1st tier	2nd tier	1st tier	2nd tier	1st tier	2nd tier	1st tier	2nd tier
Non-western Education	-.2915 (.2214)	.0607 (.2334)	-.3297 (.2237)	.0984 (.2370)	-.2997 (.2219)	.0379 (.2327)	-.3416 (.2241)	.0787 (.2363)
No Education	-.1128 (.2030)	-.1341 (.1902)	-.1247 (.2030)	-.1330 (.1900)	-.1295 (.2034)	-.1427 (.1894)	-.1411 (.2033)	-.1440 (.1892)
Primary Education	-.0309 (.2040)	-.0567 (.1880)	-.0555 (.2039)	-.0520 (.1878)	-.0306 (.2045)	-.0710 (.1874)	-.0545 (.2044)	-.0669 (.1872)
Secondary Education	.0304 (.2058)	.1360 (.1885)	.0105 (.2060)	.1552 (.1883)	.0519 (.2060)	.1161 (.1875)	.0323 (.2062)	.1367 (.1874)
Tertiary Education	.1764 (.2145)	.5539*** (.1892)	.1603 (.2148)	.5740*** (.1891)	.1830 (.2150)	.5288*** (.1885)	.1665 (.2152)	.5503*** (.1885)
Postgraduate Education	.4394 (.3058)	1.2625*** (.2265)	.4139 (.3065)	1.2842*** (.2266)	.4332 (.3070)	1.2135*** (.2262)	.4061 (.3076)	1.2348*** (.2263)

Standard errors are in parentheses, *** indicates significance at the 1% level of significance

[5] The full results of both of the labour market restricted specifications are included in the main document and the full results of the non-restricted specifications (total sample of household heads) can be found in the appendix

The results across all the specifications are generally consistent particularly for the area of interest which is the private economic returns to education at the various levels of schooling. However, for the purpose of analysis only the third and fourth specifications will be expatiated upon. They are presented below-

EDUCATIONAL CHARACTERISTICS

Private economic returns to schooling are highest at the post graduate level than at all other levels of schooling. The results show that the post graduate variable has the highest coefficients for both hurdles across both specifications implying that having a post graduate qualification has a greater influence on the probability of participating in the labour market and on the level of earnings than the all the other levels of schooling. After controlling for the presence of ability bias, the results still show that the greatest private economic returns come from the post graduate level of education although the sizes of the coefficients in the first hurdle of the various levels of schooling are smaller than before the ability of individuals was controlled for. This implies that an individual's ability affects his/her probability of getting a job in the labour market particularly for secondary degree holders and above, however, the results suggest that ability does not affect the level of earnings (or in other words ability does not affect the private economic returns to education) as the coefficients in the second hurdle are greater in the fourth specification after controlling for ability than in the third specification where ability was not controlled for thus indicating that the ability bias is present but only as pertaining to the possibility of getting a job and that in the sample population, people with greater ability acquire higher education as shown with the effect of the ability bias among the fraction of the population that has high levels of education which includes secondary, tertiary and post graduate education. Therefore, after controlling for ability, an individual with a post graduate degree is 40 percentage points more likely to get a job in the labour market compared to about 17 percentage points for the tertiary level and 3 percentage points for a secondary education degree holder. In addition, a post graduate degree holder has more than twice the private economic returns to education from earnings than a tertiary degree holder who has an increase in private economic returns to education by about 55% and a secondary degree holder whose private economic returns to education increase by about 14%. Across both specifications, the non-western style of education (Quranic education) and the lack of education have a negative influence on the likelihood of an individual participating in the labour market as well as on the level of earnings. Possessing no education reduces the odds of engaging in the labour market by about 14 percentage points as compared with having non-western education which reduces the prospects of doing so by about 34 percentage points. Likewise, not acquiring any education reduces private economic returns to education by 14% while having a non-western education reduces private economic returns to education by about 8%. Furthermore, the results show that possessing only a primary school qualification negatively influences the likelihood of participating in the labour market as well as the level of earnings. Possessing only a primary school certification reduces the likelihood of participating in the labour market by 5 percentage points and reduces the private economic returns to education by about 7%.The sign of the coefficients changes as the level of education attained increases to the secondary level i.e. secondary, tertiary and post graduate education all have a positive influence on the likelihood of an individual participating in the labour market as well as on the level of earnings. This means that there are greater private economic returns to higher education (secondary, tertiary and post graduate education) in Nigeria. Moreover, the higher the level of education an individual possesses, the greater the likelihood of getting a job in the labour market as well as the greater the level of income that the individual can receive. This is indicated in the results as the magnitude of the coefficients increases as the level of education increases from secondary to tertiary and finally to the post graduate level.

RESPONDENTS/HOUSEHOLD CHARACTERISTICS

The results show that age plays a positive role on both the probability of participating in the labour market and the amount of earnings received. The size of the household has a positive and significant effect on the decision that the household head makes to participate in the labour market.

LOCATION

The results generally show that people living in the Southern regions are more likely to get a job as well as earn higher levels of income and greater private economic returns to education. This could be because there are more highly educated people in the South than in the North whereas in the North, the most popular form of Education is the Quranic (non-Western) method of Education.

OCCUPATIONAL CHARACTERISTICS

Across all specifications, the agricultural sector gives the lowest private economic returns to education, this is plausible because despite the fact that Nigeria has a large proportion of the labour force engaged in agriculture, it is often practiced at the subsistence level. As a result of the subsistence level of farming, not much earnings accrue to the individuals that partake in this sector. In addition, the sector is seen as inferior and for people who do not have any formal education especially not for those with higher degrees of education. Alternatively, working in the mining sector gives the greatest private economic returns to education and this may be so because Nigeria is an oil resource based economy and oil workers get substantial payments in comparison with other sectors of the economy. The variable representing those that are unemployed is omitted in the second hurdle because as they have no jobs in the labour market, there is no decision that is made concerning how much they can earn.

The full results of the labour market specifications are presented below

Table 3 Estimates of the Mincer Equation using the Double Hurdle model for the household heads within the statutory Labour market age (60 years) before controlling for the ability bias

Variables	Coefficient(1st tier)	P value	2nd tier	P value
Non-western Education	-.2997 (.2219)	0.177	.0379 (.2327)	0.871
No Education	-.1295 (.2034)	0.524	-.1427 (.1894)	0.451
Primary	-.0306 (.2045)	0.881	-.0710 (.1874)	0.705
Secondary	.0519 (.2060)	0.801	.1161 (.1875)	0.536
Tertiary	.1830 (.2150)	0.395	.5288 (.1885)	0.005
Post graduate	.4332 (.3070)	0.158	1.2135 (.2262)	0.000
Working age	.1492 (.0548)	0.006	.2743 (.0615)	0.000
Household size	.0280 (.0074)	0.000	.0612 (.0080)	0.000
Gender	-.0573 (.0668)	0.391	-.2786 (.0698)	0.000
Sector	-.0695 (.0542)	0.200	.0934 (.0520)	0.072
North Central	-1.2173 (.0775)	0.000	-.4771 (.0841)	0.000
North east	-1.1820 (.0822)	0.000	-.3750 (.0897)	0.000
North west	-1.003 (.0795)	0.000	-.3493 (.0872)	0.000
South East	.1797 (.0742)	0.015	-.3292 (.0670)	0.000
South south	-.4178 (.0732)	0.000	-.0318 (.0697)	0.648
Unemployed	-3.8272 (111.7676)	0.973	omitted	
Agriculture	.9662 (.0957)	0.000	-.2920 (.1583)	0.065
Mining	2.8669 (.5731)	0.000	.7926 (.3189)	0.013
Manufacturing	1.5713 (.1537)	0.000	.2154 (.1956)	0.271
Professional/Scientific/Technical activities	1.8848 (.1614)	0.000	.3149 (.1880)	0.094
Electricity	1.7209 (.3162)	0.000	.4663 (.3093)	0.132
Construction	1.9226 (.1494)	0.000	.6185 (.1806)	0.001
Transportation	1.8340 (.1366)	0.000	.4768 (.1735)	0.006
Buying and Selling	1.3919 (.1051)	0.000	.2023 (.1640)	0.218
Financial services	1.5993 (.2885)	0.000	.3268 (.2900)	0.260
Personal services	1.3383 (.1160)	0.000	.0919 (.1711)	0.591
Education	3.4295 (.2392)	0.000	-.0251 (.1739)	0.885
Health	3.1564 (.2725)	0.000	.4321 (.2006)	0.031
Public Administration	3.2400 (.1823)	0.000	.1424 (.1657)	0.390
Observations	4880			
Log likelihood	-5764.4645			

Standard errors are in parentheses

Source: Author's own computation from Stata 11 software

Table 4 Estimates of the Mincer Equation using the Double Hurdle model for the household heads within the statutory Labour market age (60 years) after controlling for the ability bias

Variables	Coefficient(1st tier)	P value	2nd tier	P value
Non-western Education	-.3416 (.2241)	0.128	.0787 (.2363)	0.739
No Education	-.1411 (.2033)	0.488	-.1440 (.1892)	0.447
Primary	-.0545 (.2044)	0.790	-.0669 (.1872)	0.721
Secondary	.0323 (.2062)	0.876	.1367 (.1874)	0.466
Tertiary	.1665 (.2152)	0.439	.5503 (.1885)	0.004
Post graduate	.4061 (.3076)	0.187	1.2348 (.2263)	0.000
Working Age	.1410 (.0554)	0.011	.2805 (.0618)	0.000
Household size	.0271 (.0075)	0.000	.0637 (.0082)	0.000
Gender	-.0821 (.0673)	0.223	-.2549 (.0703)	0.000
Sector	-.0884 (.0548)	0.106	.1077 (.0523)	0.040
North Central	-1.4001 (.0795)	0.000	-.1462 (.0859)	0.089
North east	-1.4152 (.0861)	0.000	.0029 (.0953)	0.976
North west	-1.2122 (.0880)	0.000	.0194 (.0925)	0.834
South south	-.6082 (.0738)	0.000	.3015 (.0684)	0.000
South west	-.1811 (.0745)	0.015	.3257 (.0671)	0.000
Unemployed	-3.8379 (128.6863)	0.976	omitted	
Agriculture	1.0091 (.0971)	0.000	-.3659 (.1609)	0.023
Mining	2.8806 (.5725)	0.000	.7276 (.3196)	0.023
Manufacturing	1.6248 (.1553)	0.000	.1448 (.1977)	0.464
Professional/Scientific/Technical activities	1.9048 (.1625)	0.000	.2564 (.1905)	0.178
Electricity	1.6459 (.3222)	0.000	.4115 (.3184)	0.196
Construction	1.9367 (.1509)	0.000	.5380 (.1832)	0.003
Transportation	1.8599 (.1379)	0.000	.4243 (.1761)	0.016
Buying and Selling	1.4300 (.1066)	0.000	.1231 (.1670)	0.461
Financial services	1.6110 (.2881)	0.000	.2586 (.2909)	0.374
Personal services	1.3751 (.1171)	0.000	.0203 (.1734)	0.907
Education	3.4640 (.2415)	0.000	-.1113 (.1765)	0.528
Health	3.1899 (.2741)	0.000	.3425 (.2036)	0.092
Public Administration	3.2707 (.1834)	0.000	.0669 (.1685)	0.691
Educational level of Father	.0031 (.0018)	0.081	-.0015 (.0019)	0.424
Educational level of mother	-.0026 (.0019)	0.175	-.0006 (.0021)	0.793
Observations	4821			
Log likelihood	-5699.4453			

Standard errors are in parentheses Source: Author's own computation from Stata 11 software

4.1 DIFFERENCES BETWEEN THE OGUNDARI AND AROMOLARAN (2013) STUDY AND THIS STUDY

RESULTS FROM THE OGUNDARI AND AROMOLARAN (2013) STUDY

The Ogundari and Aromolaran (2013) study was based on the 2003/2004 Nigerian Living Standard Survey (NLSS). They examined the effect of the highest level of education attained by household heads on household welfare using labour market earnings as an indicator. Their study employs the Double Hurdle model and the results from their empirical analysis show that the private economic returns to schooling are considerably greater at the tertiary level of schooling than at primary, secondary and post graduate levels of schooling. Amaghionyeodiwe and Osinubi (2007:161) suggest that the reason for the disparities in studies for which level of schooling generates the highest economic returns may be because of the ability bias and measurement error that is present in such estimations.

Ogundari and Aromolaran (2013) however, do not account for endogeneity in the Mincer earning-schooling equation which could lead to possible correlation between the observed amount of schooling and the error term of the earnings equation. They cite the lack of availability data on valid instrumental variables such as educational policies which would have an exogenous relationship with schooling thus removing the correlating effect between the error term and schooling as the constraining reason. They write that one of their most important findings is that the private economic returns to post graduate education is lower than that of tertiary education and explain that this may be because the Nigerian labour market does not adequately discriminate between graduate and post graduate levels of education. They conclude that enhancement in Nigerian household economic welfare is influenced to a greater degree by the acquisition of tertiary education by household heads when compared to other levels of education.

Their results are presented below

Table 5 Summary of Results from Ogundari and Aromolaran (2013)

Variables	First Hurdle	Second Hurdle
Non-Western Education	0.1313 (0.1913)	0.0528 (0.0662)
Primary Education	0.2044** (0.0934)	0.0724** (0.0317)
Secondary Education	0.0246 (0.0415)	0.1541*** (0.0166)
Tertiary Education	0.1277* (0.0680)	0.5729*** (0.0322)
Post Graduate Education	0.0051** (0.0693)	0.1892*** (0.0238)

Standard errors are in parentheses, *, **, *** indicate 10%, 5% and 1% levels of significance respectively

Source: Ogundari and Aromolaran (2013)

This study estimates the Mincer earning function and determines the private economic returns to education in Nigeria based on the techniques employed by the Ogundari and Aromolaran (2013) study. An objective of the paper was to determine if there are any differences between the results from their study and this study concerning what level of education gives the highest private economic returns to education in Nigeria.

In order to achieve this, the same specification and methodology that was employed in the aforementioned study was utilized in this study as well. As noted earlier however, Ogundari and Aromolaran (2013) did not account for the ability bias in their estimation, so this study estimated

the same function and controlled for the presence of ability bias by adding as a control regressor, the educational level of both parents of the respondent. As noted earlier, the earnings function was estimated on the general sample of household heads as well as on a restricted sample which included only household heads within the statutory age range of the Nigerian labour market (i.e. 60 years) and across all specifications, the results consistently show that the post graduate level of education gives the highest private economic rate of returns as well as increases the chances of an individual getting a job in the labour market. This result is significant even at the 1% level of significance. This finding is quite different from the Ogundari and Aromolaran (2013) study which concludes that the tertiary level of education gives higher private economic returns to education than all other levels of education including the post graduate level of education. Discovering that having a post graduate degree increases the chances of getting a job in the Nigerian labour market over the tertiary degree is quite plausible because with the ever tightening formal sector of the labour market, employers use academic qualifications as a criterion to 'trim down' the number of applicants therefore, someone with a higher degree for e.g. a masters' is more likely to get a job in the formal sector than someone with an undergraduate degree. This suggests that education is also used as a screening device in the Nigerian labour market. For the purpose of further analysis, the results from the first specification of the Mincer earnings function which is similar to the Ogundari and Aromolaran (2013) specification are compared with their estimated results. There exist certain differences between both studies as regarding the signs and magnitudes of the coefficients estimated in the first and second hurdles. For example, regarding the non-western form of education, their results indicate that having this type of education increases an individual's chances of working in the labour market by about 13 percentage points as opposed to the results from this study which show that having this type of education reduces the prospects of working in the labour market by about 29 percentage points. Also, their results show that acquiring only a primary education increases the probability of getting a job by 20 percentage points contrasting with the results from this study which show that stopping at this level of education reduces the likelihood of getting a job by 3 percentage points. Interestingly, for the higher levels of education (that is for the secondary and the tertiary levels) the direction of the effect of educational levels on the probability of working in the labour market are similar in both studies so also the magnitude of the coefficients. Their results show that possessing a secondary education increases the possibility of getting a job by 2 percentage points while the results from this study indicate that having a degree from this stage of education increases this possibility by 3 percentage points. Furthermore, acquiring a tertiary degree increases the prospects of working in the labour market by about 13 percentage points based on their study while this study shows that having a tertiary education increases the chances of getting a job in the labour market by 17 percentage points. Ogundari and Aromolaran (2013) however, find that having a post graduate degree increases the chances of getting a job by about 1 percentage point although this study finds that acquiring post graduate education increases the likelihood of working in the labour market by about 44 percentage points. As pertaining to the private economic returns to education, Ogundari and Aromolaran (2013) determine that obtaining the non-western form of education increases an individual's private economic returns to education by 5%, similarly, this study finds that this type of education increases an individual's private economic returns to education by 6%. At the level of primary education, they find that the private economic returns to education for an individual who acquires only this level increases by 7% whereas the results from this study indicate that the private economic returns to primary education reduce by about 6%. The private economic returns to secondary school education are quite similar in magnitude with their study estimating an increase to private economic returns at 15% and this study estimating the increase at 13%. In the same vein, their study estimates an increase in the private economic returns to tertiary education by 57% while this study estimates this increase at 55%. In addition, the results from their study show that the private economic returns to post graduate education increase by about 19%, whereas the results show that the private economic returns to post graduate education increase by over a hundred

percent and this estimate is significant at all levels of significance. Therefore, in summary, after comparing the results from the Ogundari and Aromolaran (2013) study and those from this study, it can be concluded that over time[6], the probability of people with higher education (that is, secondary schooling and above) gaining employment in the Nigerian labour market has increased, likewise the private economic returns to tertiary and post graduate education have also increased. However, the private economic returns to secondary education have reduced by 2 percentage points. At the same time, the probability of individuals with lower education (primary and non-western education) getting employed in the Nigerian labour market has fallen and in like manner, their private economic returns to their type of education.

Additionally, the differences between the results from the Ogundari and Aromolaran (2013) study which does not control for ability and the results from the second specification estimated in this study that accounts for the ability bias are expounded upon as follows. After controlling for the ability of the individual, the likelihood of an individual with non-western education getting a job in the labour market reduces by 32 percentage points as compared with their estimate of 13 percentage points. The prospects of a person with only a primary school education gaining employment in the labour market reduces by 5 percentage points as opposed to their results which indicate that such an individual will have this prospect increase by 20 percentage points. Also, a secondary education degree holder has his/her chances to gain employment increased by a percentage point as compared with 2 percentage points from their results. A person that has acquired the tertiary level of education has the probability of working in the labour market increase by 16 percentage points as compared with their corresponding estimate of 12 percentage points. Moreover, an individual with a post graduate degree has an estimated increase in the probability of gaining employment in the labour market by about 41 percentage points in comparison with their estimate of about one percentage point. Regarding the private economic returns to education after controlling for the ability of the individual, the private economic returns to the non-western form of education increases by about 10% and this is about twice their estimated value of 5%. Furthermore, the private economic returns to education for a person with only a primary school degree reduce by about 5% as opposed to their results which show that the private economic returns to education increase by 7% to a primary degree holder. It is worth noting that the estimated increase in private economic returns to education for individuals with secondary and tertiary education are the same in both studies and that is 15% and 57% respectively, this supports the earlier mentioned observation that ability does not affect the private economic returns to education (as their study does not control for ability). Finally, acquiring a post graduate degree increases the private economic returns to that level of education by about 128% as compared to their estimate of 19%. Hence, after controlling for an individual's ability, a comparison of results shows that over time, the probability of people with lower education including secondary education has fallen (however, for the secondary level, the difference is just a percentage point) while the odds have improved for those with higher education (tertiary and post graduate education) to gain employment in the Nigerian labour market. Also, the private economic returns to education have improved slightly for individuals with non-western education and immensely and significantly for those with post graduate degrees. However, the private economic returns have fallen for the primary level of education and have remained the same over time for the secondary and tertiary levels of education.

Generally, the fall in private economic returns to individuals with lower levels of education is most likely to be caused as a result of the increasing redundancy of their skill set in the gradually

[6] As this study aims to compare the private economic returns to education as estimated by Ogundari and Aromolaran (2013) based on data collected in 2003 and more recent and similarly structured data from 2010/2011, over time refers to the 8 years in between the periods of data collection.

emerging knowledge based economy, moreover, this is also linked to the fall in their probabilities of gaining employment and this reflects the fact that having a low level of education reduces an individual's competitiveness in the Nigerian labour market. Poor private economic returns to the non-western form of education reflects the nature of the labour market and the society as a whole in that both are constructed in such a way as to place greater value on formal education and give greater benefits to people who are educated with the Western form of education. Simultaneously, private economic returns have been shown to increase with higher levels of education and this is linked to the increasing probabilities of people with higher education to gain employment in the labour market. This implies that there is an increase in demand for higher educated and skilled labour, this, however, is expected in a developing country like Nigeria which is in the process of developing its technical capacity in order to increase its economic competitiveness to catch up with more advanced economies. Thus, there is a need for greater investments in infrastructure development in the formal sector to provide more jobs since there are higher returns to formal education.

Ogundari and Aromolaran (2013:13) write that the reason that their study does not completely prove the human capital theory's view that the higher the level of education that an individual acquires, the greater his/her private economic returns as reflected in their results which show that there are greater returns to the tertiary level of education when compared to the post graduate level of education is because of the inadequate discrimination between these levels of education in the Nigerian labour market. They note that this could be because employers were picking workers solely based on their tertiary degrees and then training these tertiary degree holders on the job to attain specific skill sets and therefore, not specifically looking for individuals with higher degrees like a post graduate degree. They predict that this would change when the structure of the labour market adjusts such that the unique skill set possessed by post graduate holders begin to be demanded for. Based on the results of study which employed more recent data, it appears that this change in the structure has begun, such that employers in the Nigerian labour market have embarked upon the process of demanding for more skilled and highly educated individuals. Although, based on the human capital theory, the increase in acquisition of higher education is to be encouraged as higher education increases individual incomes and productivities which translates into a rise in national incomes, there are some implications of this trend that may not be easily dealt with. These implications include that-

- People with lower levels of education will face an increasing amount of pressure to attain more education so that they too can have a better chance of procuring jobs. As not many people can afford private tertiary education, this will put more pressure on the Government to sponsor higher education.
- There will also be an increase in competition among the highly skilled for available jobs.
- There will be a devaluation of the informal sector as the focus will be shifted towards the formal sector and acquiring the skills necessary to penetrate that sector, consequently diminishing the contribution of the informal sector to the national economy.
- There will be a rise in graduate un(der)employment as there will be in an increase in 'over qualification' for jobs available in both the formal and informal sectors of the economy.

4.2. FURTHER ANALYSIS OF RESULTS

This section analyses the results of the study in relation with the human capital theory and the arguments relating to private economic returns to schooling.

4.2.1 RESULTS OF STUDY AND THE HUMAN CAPITAL THEORY

As noted earlier, this study differentiated between the undergraduate and postgraduate private economic returns to education which are can be both categorized as higher education based on the study by Ogundari and Aromolaran (2013) on the private economic returns to education in Nigeria.

The human capital theory postulates that education increases an individual's productivity and this is reflected in his/her earnings, this therefore, implies that the higher the level of schooling that an individual acquires, the greater his/her chances are of working in the labour market and the higher the level of income that the individual earns. Bjorklund and Kjellstrom[7] (2002:195) write that the Mincer earnings function is famously used because it emerges from human capital theory. The results of this study support the claim of the human capital theory in that the higher the level of education an individual has, the greater the probability of holding a job and the higher the private economic returns to educational investment. This is indicated with the increase in the sizes of the coefficients as the level of education increases as well as the positive sign associated with the higher levels of education in all results across both hurdles. The results suggest that with higher education, productivity increases and wages also. In the labour market restricted results, the age of the individual has a positive and significant relationship with the probability of working in the labour market as well as the amount that an individual earns and this seems to suggest that as educated people get older, they earn more. This supports the argument of Blondal et al. (2002:50) that educated workers have a 'longer working life' than the less educated. The results of study also concur with the findings of Grootaert (1990) in that possessing an informal education insignificantly affects the earning potential of an individual. Furthermore, recalling that the Mincer earnings function was estimated on household heads, the higher the private economic returns to education that accrue to a household head as a result of his/her level of education, the better the quality of welfare that the household receives. Therefore it can be said that there are positive externalities associated with the educational level of the household head in accordance with the notion that accumulation of human capital improves societal welfare.

4.2.2 RESULTS OF STUDY AND PRIVATE ECONOMIC RETURNS TO SCHOOL ARGUMENTS

This study measures the average private economic returns to schooling at various levels of education in Nigeria and the results generally show that the higher the level of schooling, the greater the private economic returns to educational investment. The results are in line with studies such as Uwaifo-Oyelere (2011) and Amaghionyeodiwe and Osinubi (2007) which report that the highest private economic returns to education come from post-secondary education in Nigeria. Other studies such as Kahyarara and Teal (2007), Teal (2011), Patrinos et al. (2006) show that at least for paid employment, the private economic returns to education increase alongside its level.

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[7] see this paper for the assumptions that hold in order to interpret the coefficient on schooling as the private economic return to investment in schooling.

Despite the growing supply of graduates leading to the problem of increasing underemployment in the country, it is interesting to note that the highest private economic returns to education for individuals still come from higher education. This is in line with the study of Bourbeau et al. (2012) based on the Canadian labour market which reports that private economic returns to higher education consistently rise even with an increase in the supply of tertiary graduates. This is quite baffling because one would expect that the increase in the number of graduates chasing too few jobs in the formal sector would reduce their economic value and thus the private economic returns to that level of education. However, Lassibille and Tan (2005:105) suggest that this occurs usually where the formal sector is small and thus income levels are 'sticky' in order to attract highly qualified individuals. In addition, Uwaifo-Oyelere (2011:746) observes that increases in private economic returns to education in Nigeria occurred after democratic transition due to some reforms in the educational sector such as an increase in employment of teachers and a merit scheme to reward excellence in performance.

Studies such as Psacharopoulos (1990) showed higher returns from education emanating from the primary level of education especially in developing countries, however, this study shows that there is in fact a negative relationship across both hurdles indicating that possessing only primary education is a 'liability' in Nigeria. Bennell (2002:1189) suggests that it is the poor quality of primary schooling that dampens the returns to primary education in Sub Saharan Africa; this is echoed by Uwaifo-Oyelere (2011:777) who notes that although the poor quality of education at that level may be to blame, part of the reason for the poor private economic returns to primary education could be because the educational policies in Nigeria appear to favour the tertiary level of education. However, Heckman et al. (1996:599) allow for a non-linear relationship between earnings and schooling and conclude that the quality of schooling only affects the rate of returns to higher education. Furthermore, the results of this study indicate that the private economic returns to education in Nigeria are convex in nature and that the structure of the labour market encourages greater economic returns to formal and western education. Some studies like Amaghionyeodiwe and Osinubi (2007) and Pissarides (2000) and Psacharopoulos (1994) report that the private economic returns to education are higher in the private sector than the public sector, however, the scope of this study does not cover this train of analysis.

Bennell (1996:237) however cautions that since a large proportion of the labour force in developing countries is engaged in subsistence production in rural areas and earn far below the earnings from the formal sector, therefore using the incomes of the smaller part of the working population to estimate the rate of returns to education could lead to an upward bias in results. As noted previously about 67.6% of the sample population used for this survey are from the rural area, therefore, it is expected that this bias has been minimized somewhat.

CHAPTER FIVE

CONCLUSION

5.0 SUMMARY AND CONCLUSION

This study set out to estimate the private economic returns to the different levels and types of education in Nigeria thus establishing if there are differences in the private economic returns to these various levels and types among which include the non-western form of education, for the informal type of education and for the formal type of education, the primary education, secondary, tertiary and post graduate levels of education. More importantly, the study had the objective of determining if these private economic returns to the various levels and types of education as mentioned above were consistent with an earlier study done by Ogundari and Aromolaran (2013) on the private economic returns to the above listed levels and types of education in Nigeria or if the economic climate had evolved and thus changed their findings. It was important to determine the consistency of these results because their study was based on Nigeria Living Standards Survey (NLSS) data collected in 2003/2004 and more recent similarly structured data that is the General Household Survey (GHS) of 2010/2011 has become available. In order to determine the above stated objective, the same econometric estimation technique that they employed in their study was also applied in this study that is the Double Hurdle model. The Double Hurdle technique is useful for estimating the Mincer Earnings function as it acknowledges and allows for individuals that report zero earnings from the labour market due to their current unemployment status. In like manner, the specification that they use in order to estimate the Mincer (1974) earnings function is also adopted in this study, however this study goes a step further by controlling for the ability bias that is widely accepted as being present in the earnings schooling relation as they do not control for this in their study. Because the estimating technique determines the second hurdle (i.e. the private economic returns to education) based on whether the outcome from the first hurdle is non-zero and positive (i.e. if the individual holds a job), the reported estimates are applicable for individuals who are educated and already have jobs.

This study finds that in accordance with the human capital theory, individuals with higher levels of education have higher private economic returns to education. These private economic returns increase significantly with the level of education that an individual acquires. The results of this study have some similarities with the study by Ogundari and Aromolaran (2013) in finding out that there are increasing private economic returns to higher education such as secondary and tertiary education, nevertheless there are some differences in the estimated results. This study discovers that there are decreasing private economic returns to primary education and very importantly, that the highest rate of private economic returns arises from the post graduate level of education. This is in contrast with their estimated results which showed that the highest rate of private economic returns arose from the tertiary level of education. Furthermore, the results from this study show that the innate ability of the individual does not affect the individual's level of earnings.

Therefore, this study agrees with the postulation of the human capital theory that greater investment in and accumulation of human capital at the individual level through education enhances an individual's productivity and that this is reflected in such a person's level of income and in his/her private economic returns. Thus, it is important for greater individual and government investments in higher education to be encouraged as a means of lifting households out of poverty, this implies however, that there also needs to be better investments at the lower levels of education as people would have to pass through these lower stages before they can get to the more advanced stages of education.

The contradiction between greater private returns to higher education and the high incidence of graduate un(der)employment could be attributed to the inadequate amount of jobs for the teeming and ever increasing number of graduates in the economy. It could also be because many graduates may prefer to hold off gaining employment because they are searching for the job that they feel will pay them more remuneration hence, not taking up jobs that are beneath their expectations.

In conclusion, therefore, entrepreneurship should be encouraged among students and infrastructure that encourages entrepreneurial ideas and implementation of these ideas need to be provided. Also, skills that are relevant and demanded in the current 'Knowledge Economy' and 'Information Age' need to be taught so that the problem of the seeming mismatch between graduate training and available jobs can be ameliorated.

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APPENDICES

Appendix A: Estimates of the Mincer Equation using the Double Hurdle model for the total sample of household heads without controlling for the ability bias

Variables	Coefficient(1st tier)	P value	2nd tier	P value
Non-western Education	-.2915 (.2214)	0.188	.0607 (.2334)	0.795
No Education	-.1128 (.2030)	0.578	-.1341 (.1902)	0.481
Primary	-.0309 (.2040)	0.880	-.0567 (.1880)	0.763
Secondary	.0304 (.2058)	0.882	.1360 (.1885)	0.471
Tertiary	.1764 (.2145)	0.411	.5539 (.1892)	0.003
Post graduate	.4394 (.3058)	0.151	1.2625 (.2265)	0.000
Age	-.0055 (.0016)	0.000	-.0041 (.0018)	0.023
Household size	.0324 (.0074)	0.000	.0670 (.0082)	0.000
Gender	-.0527 (.0670)	0.432	-.2634 (.0702)	0.000
Sector	-.0715 (.0543)	0.188	.0995 (.0522)	0.057
North Central	-.0211 (.0783)	0.788	-.1117 (.0985)	0.257
North west	.1879 (.0750)	0.012	.0165 (.0986)	0.867
South East	1.3989 (.0843)	0.000	.0375 (.0914)	0.681
South south	.7859 (.0813)	0.000	.3307 (.0912)	0.000
South west	1.2185 (.0833)	0.000	.3611 (.0912)	0.000
Unemployed	-3.8314 (127.2882)	0.976	omitted	
Agriculture	.9513 (.0962)	0.000	-.2870 (.1590)	0.071
Mining	2.8591 (.5718)	0.000	.8246 (.3199)	0.010
Manufacturing	1.5555 (.1540)	0.000	.2342 (.1962)	0.233
Professional/Scientific/Technical activities	1.8655 (.1616)	0.000	.3355 (.1886)	0.075
Electricity	1.6986 (.3172)	0.000	.4665 (.3103)	0.133
Construction	1.9017 (.1498)	0.000	.6321 (.1812)	0.000
Transportation	1.819 (.1365)	0.000	.5086 (.1739)	0.003
Buying and Selling	1.3787 (.1052)	0.000	.2194 (.1647)	0.183
Financial services	1.5808 (.2897)	0.000	.3436 (.2909)	0.238
Personal services	1.3203 (.1166)	0.000	.1090 (.1718)	0.526
Education	3.4208 (.2388)	0.000	.0034 (.1746)	0.984
Health	3.1420 (.2731)	0.000	.4714 (.2023)	0.020
Public Administration	3.2422 (.1822)	0.000	.1715 (.1665)	0.303
Observations	4866			
Log likelihood	-5754.0398			

Standard errors are in parentheses

Source: Author's own computation from Stata 11 software

Appendix B: Estimates of the Mincer Equation using the Double Hurdle model for the total sample of household heads after controlling for the ability bias

Variables	Coefficient(1st tier)	P value	2nd tier	P value
Non-western Education	-.3297 (.2237)	0.141	.0984 (.2370)	0.678
No Education	-.1247 (.2030)	0.539	-.1330 (.1900)	0.484
Primary	-.0555 (.2039)	0.785	-.0520 (.1878)	0.782
Secondary	.0105 (.2060)	0.959	.1552 (.1883)	0.410
Tertiary	.160316 (.2148)	0.455	.5740 (.1891)	0.002
Post graduate	.4139 (.3065)	0.177	1.2842 (.2266)	0.000
Age	-.0055 (.0016)	0.001	-.0044 (.0018)	0.015
Household size	.0314 (.0075)	0.000	.0699 (.0082)	0.000
Gender	-.0772 (.0676)	0.254	-.2379 (.0706)	0.001
Sector	-.0899 (.0549)	0.101	.1135 (.0526)	0.031
North Central	-.1881 (.0833)	0.024	-.1644 (.1015)	0.105
North east	-.2138 (.0783)	0.006	-.0056 (.1009)	0.956
South East	1.2353 (.0886)	0.000	-.0146 (.0934)	0.875
South south	.6118 (.0851)	0.000	.2808 (.0933)	0.003
South west	1.0534 (.0866)	0.000	.3051 (.0930)	0.001
Unemployed	-3.7219 (111.8675)	0.973	Omitted	
Agriculture	.9923 (.0976)	0.000	-.3618 (.1615)	0.025
Mining	2.8713 (.5711)	0.000	.7589 (.3206)	0.018
Manufacturing	1.6068 (.1556)	0.000	.1619 (.1982)	0.414
Professional/Scientific/Technical activities	1.8843 (.1627)	0.000	.2766 (.1911)	0.148
Electricity	1.6180 (.3233)	0.000	.4084 (.3194)	0.201
Construction	1.9146 (.1512)	0.000	.5526 (.1838)	0.003
Transportation	1.8411 (.1378)	0.000	.4547 (.1766)	0.010
Buying and Selling	1.4148 (.1067)	0.000	.1395 (.1676)	0.405
Financial services	1.5927 (.2893)	0.000	.2729 (.2918)	0.350
Personal services	1.3546 (.1177)	0.000	.0360 (.1741)	0.836
Education	3.4530 (.2410)	0.000	-.0827 (.1772)	0.641
Health	3.1732 (.2747)	0.000	.3839 (.2052)	0.061
Public Administration	3.2710 (.1833)	0.000	.0964 (.1692)	0.569
Educational level of Father	.00280 (.0018)	0.114	-.0015 (.0019)	0.443
Educational level of mother	-.0026 (.0019)	0.177	-.0005 (.0021)	0.811
Observations	4807			
Log likelihood	-5688.718			

Standard errors are in parentheses
Source: Author's own computation from Stata 11 software