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The Utilization of Human Capital and Economic Growth in Nigeria

Oluwole Owoye, Ph.D.
Professor of Economics
Department of Social Sciences
Western Connecticut State University
181 White Street
Danbury, CT 06810
United States of America

Olugbenga A. Onafowora, Ph.D.
Professor of Economics
Department of Economics
Susquehanna University
Selinsgrove, PA 17870
United States of America

Abstract

This paper examines the utilization of human capital of graduates from federal, state, and private universities seeking gainful employment in Nigeria's labor market. This paper uses a descriptive model to examine the utilization of human capital in Nigeria, which has been falling due to the rising unemployment of university graduates. We argue that one of the fundamental causes of rising unemployment of university graduates, in the past four decades, is the oversupply of university graduates coupled with the excessive job destruction in comparison to the meagre job creation in Nigeria. Moreover, the excessive human capital acquisition since the late-1970s and early 1980s may be actually growth-retarding because the labor markets and the private sectors in Nigeria lack the absorptive capacity.

Key words: Human capital, Graduate unemployment, Utilization rate, Economic growth

JEL Classification: J24, O15, O43, O49, O55

1. Introduction

This paper examines the synergy between university graduates human capital utilization and economic growth in Nigeria over the past five decades. According to economic growth theory, human capital is defined as the investment in education, which can be acquired through formal training, on-the-job-training, apprenticeship, and life experiences. Over the past two decades, growth economists have come to focus more attention on the importance of education or human capital in economic growth, and the literature is replete with theoretical and empirical studies on the subject. In one of the earliest studies that examined the relationship between human capital and growth, Nelson and Phelps (1966) argued that economic growth is driven by the *stock* of human capital, and that this affects a country's ability to innovate or catch up with more advanced countries. According to Nelson and Phelps, the differences in growth rates across countries are due to the differences in human capital stocks, and the abilities to generate technological progress.

In line with the Nelson and Phelps' study, Lucas (1988) argued that education and learning-by-doing are two alternatives to technological change. He argued that economic growth is primarily driven by the accumulation of human capital, and that the differences in growth rates between countries are mainly attributable to the differences in the rate at which countries accumulate human capital.

Similarly, studies by Barro (1991, 1997), Barro and Sala-i-Martín (1995), and Barro and Lee (1994) argued that there is a strong correlation between a country's level of educational attainment and its subsequent economic growth, and that public expenditure on education has a significant positive effect on economic growth. Barro and Sala-i-Martín (1995) found that the level of educational attainment is significantly correlated with economic growth across a cross-section of countries, and that public spending on education has a significant positive effect on growth.

Many developing countries such as Nigeria, South Korea, Taiwan, Thailand, Malaysia, and Singapore have adopted policies that provide free education at nearly all levels. For these countries, the objectives were to bridge the gap in human capital accumulation in comparison with more advanced economies, promote economic growth through human capital, and catch-up with the developed countries. Judging by the annual growth rates of South Korea, Taiwan, Thailand, Malaysia, and Singapore over the past three decades, one may conclude that the policy of government subsidization or funding of education in order to acquire human capital yielded positive growth results. However, one cannot conclude the same for Nigeria based on its economic growth record because of the low rate of human capital utilization since the late 1970s.

Our examination of the utilization of graduate human capital in Nigeria would help in understanding the consequences of the rapid supply of education through the proliferation of universities and the explosive demand for university education (human capital) since the late 1970s. Since gaining independence in 1960, Nigeria has consistently maintained a policy of universal free primary education. During the past three decades, it shifted to a policy of subsidizing and/or funding secondary and university/higher education. As a matter of fact, the federal and state governments own, operate, and fund several universities, colleges of education, and polytechnics across the country. This policy shift was based on the premise that higher education is crucial for productivity and economic growth. Current growth theories identify ways in which productivity and growth could be accomplished. Economic theory suggests that highly skilled workers drive technological innovations through research which in turn leads to productivity increases. Even in the absence of research output, labor economists and growth theorists share the view that a country with highly skilled labor force (acquired through investment in education) has a better chance of growing than one with lesser skilled labor force.

This paper contributes to the literature in several ways. First, by examining the utilization of human capital at the graduate level in Nigeria since the 1960s to date, a period marked by increased rate of human capital accumulation but a lackluster or at best anemic economic growth record, we assert that the *stock* of human capital does not translate to economic growth if the economy lacks the absorptive capacity. Economic theory and empirical studies have concluded that human capital accumulation and economic growth are positively correlated across countries. There is therefore a compelling need to understand the poor economic performance in Nigeria despite her rapid accumulation of human capital since the mid-1970s. Second, the methodology employed in this study to examine human capital utilization in the form of university graduates in Nigeria can be readily applied to the aggregate utilization of human capital in the production process; and this can help answer the question posed earlier of whether the government resources in absorptive capacity strapped developing countries like Nigeria should continue to emphasize primary-secondary education versus vocational or middle level technical education versus college/university education more so in light of the fact that employers in many of these countries complain about the quality of university education and derisively refer to university graduates as "half-baked" goods.

The remainder of this study is organized as follows. In Section 2, we provide a brief literature review of studies that examined the unemployment of university graduates in Nigeria. In section 3, we examine some of the challenges with respect to the conceptualization and the measurement of total graduate turnouts from universities in Nigeria. Section 4 presents a descriptive model of graduate turnouts and human capital utilization rate within the framework of Beveridge Curve. Section 5 concludes based on the conceptualization of the changes in human capital utilization in Nigeria.

2. Literature Review

Before 1978[1], research scholars rarely focused on the issue of graduate unemployment in Nigeria because of the absorptive capacity of the labor market [see Diejomaoh (1979), Ojo (1979), and Fajana (2000)]. During the 1960s and early 1970s, the recruitment of expatriates and other Nigerians with university degrees from abroad was a common practice due to the shortages of qualified personnel to fill some technological and professional jobs. In other words, these expatriates complemented domestic university graduates rather than substitutes.

Studies that have examined the problem of high unemployment of university graduates in Nigeria, since the late 1970s and early and mid-1980s, have attributed it to many factors. According to Dabalen, *et al*. (2001), the problem of unemployment of university graduates in Nigeria could be attributed to the unprecedented increase in the supply of skilled university graduates relative to the poor labor demand for university graduates since the early 1980s. In addition, Dabalen, *et al*. (2001) pointed out that in 1986, federal universities alone supplied 27,312 job-seekers with degree training and that by 1991 graduate turnout had risen to over 41,000. In 1997, the annual labor market entrants with a university education topped 47,000. It is important to note that these figures are lower bound estimates because in addition to federal universities, numerous state and private universities also turned out graduates into the labor market, which further increased supply if post-graduate entrants are counted.[2]

Other causal factors of graduate unemployment in Nigeria include inadequate government funding of federal and state universities, inadequate skill/human capital acquisition, weak industrial-manufacturing structure and support, generational and attitudinal change in terms of graduates' perceptions of jobs that are not white-collar jobs, and corruption [see Eneji *et al*. (2013), Shadare and Tunde (2012), Samuel *et al*. (2012), Pitan and Adedeji (2012), Akinyemi *et al*. (2012) Fnae *et al*. (2008), Oni (2000, 1999, 1996, 1994, 1988, 1987)]. Even though the general consensus is that the supply of graduates is greater than the demand for graduates in the labor market, Dabalen *et al*. (2001) pointed out that increases in the supply of certain critical skills such as medicine, pharmacy, agriculture, and engineering have been much less dramatic, and that the proportion of graduates from these disciplines among total graduate turnouts remained constant because student enrollment numbers remained stagnant in these disciplines.

3. Concepts and Measurement of Graduate Turnout/Unemployment

The studies reviewed above focused on the increasing level of unemployment of university graduates by identifying and explaining some of the causal factors. Many of these studies are region-specific or state-specific or tracer studies that cannot be generalized on the aggregate. Some studies asked questions such as: "What are the skills demanded by the employers of labor from university graduate? To what extent is the mismatch between the skill acquired by university graduates and the demands of their jobs?"

Our analysis in this paper is rooted in the framework of the Beveridge curve that examines the relationship between unemployment rate and vacancies. In adopting this framework in the analysis of the labor market for university graduates in Nigeria, our focus is on the rate of utilization of the human capital acquired by graduates and the unemployment rate of graduates but not the aggregate unemployment rate, which appeared to be much lower in comparison to the graduate unemployment rate. In other words, the issue is about human capital utilization of university graduates and how to measure the rate of human capital utilization of university graduate.

Over the past five decades, the number of universities owned by the federal government of Nigeria has expanded beyond the first and second generation universities[3]. According to the National University Commission (NUC), there are 162 universities (41 federal, 47 state, and 74 private universities) in Nigeria as of December 2017. The major problem in analyzing the utilization rate of human capital of university graduates in the labor market in Nigeria is the availability of accurate and consistent data.

[1] By 1975, there were 13 universities known as the first (Ibadan, Lagos, Zaria, Ife, and Benin) and second (Calabar, Jos, Kano, Maiduguri, Sokoto, Ilorin, and Port Harcourt) generation universities; and since then, new ones belong to the third generation universities.

[2] To put these numbers in the proper perspective, Nigeria had a total of 39 universities between 1960 and 1999 (see Fnae *et al.* (2008). According to the National University Commission, Nigeria has 41 federal universities, 47 state universities, and 74 private universities as of December 2017.

[3] The first generation of universities consists of the 10 oldest universities established between 1948 and 1969, and the second generation consists of 12 universities established between 1970 and 1985. The establishment of universities in Nigeria began with University of Ibadan in 1948.

According to Dabalen *et al*. (2001), "Obtaining accurate information on labor demand is perhaps the most difficult challenge in collecting labor market information. This is because hiring decisions by firms are typically uncoordinated and in many cases unannounced……..Additional labor analysis problems in Nigeria stem from the fact that no systematic collection of labor market data takes place. Therefore, it becomes necessary to infer labor demand for university graduates through secondary data such as manpower surveys, the few existing labor market studies, and direct interviews with major employers." Due to the data problem, we use a descriptive model to help understand and measure the rate of human capital utilization of graduates in Nigeria's labor market.

4. A Descriptive Model of the Utilization of Human Capital of University Graduates

Given the problems of data collection regarding aggregate turnouts of university graduates in Nigeria since independence, we strongly believe that a descriptive-graphical model of the utilization of graduate human capital can shed more light, and this is more desirable than spurious regression results based on inaccurate data.[4] More importantly, our model explicitly accounts for the impact of job creation and job destruction on the utilization of human capital of university graduates in Nigeria.

To begin, we assume that human capital is embodied in every worker in the labor force in Nigeria but the focus is on university graduates because they are the source of research and technological assimilation and/or diffusion needed to put the country on the growth and development frontier. At any port of entry into the labor market, some of these graduates will be employed and others unemployed. Their labor market entry can be expressed as:

$$G = E + U \qquad (1)$$

where G is the annual stock of graduate turnouts from federal, state, and private universities, E represents the number of those graduates who are employed or utilized in the labor market, and U represents those who are unemployed or unutilized, but are actively searching and willing to take available jobs. Dividing both sides of equation (1) by G yields:

$$\frac{E}{G} + \frac{U}{G} = 1 \qquad (2).$$

Equation (2) states that the employed/utilized, $\frac{E}{G}$ or e plus the unemployed/unutilized graduate human capital, $\frac{U}{G}$ or u, in the labor market must sum to 1 (or 100 percent) hence, the rate of utilization/employment of graduate human capital is expressed as:

$$\frac{E}{G} = 1 - \frac{U}{G} \quad \text{or} \quad e = 1 - u \qquad (3).$$

Equation (3) states that there is an inverse relationship between the human capital utilization rates (e) embodied in university graduates and the unemployment rate (u). When the economy's aggregate output and unemployment rate are at their natural rates, frictional and structural unemployment still exist; therefore, equation (3) tells us that e is less than one. This implies that the utilization of human capital cannot exceed 100 percent regardless of labor market conditions. Essentially, the economy cannot overreact or overcompensate for e and u for small or large changes in the labor market. In other words, the absorption of graduates into the labor market cannot exceed one if there are external shocks.[5]

Figure 1 depicts the locus of the rate of utilization of human capital acquisition by university graduates and their unemployment rate in the labor market. It shows that e and u ranged between 0 and 1, with a negative slope, which means that as the unemployment of graduates rises, the rate of utilization/employment of human capital acquired falls, and vice-versa. The fact is that the rate of utilization/employment of human capital in the 1960s and 1970s was very high when the labor market was tight; therefore, the unemployment of graduates was not an issue for empirical analysis.

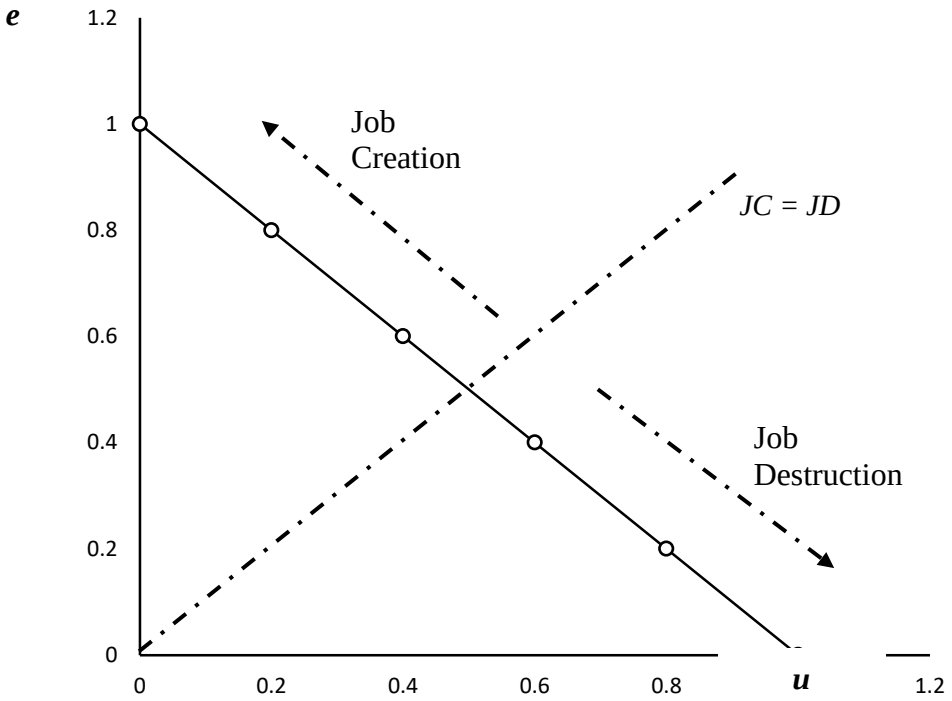
[4]Morten Jerven (2015) in his book (*Africa: Why Economists Get It Wrong*) provides well-articulated arguments regarding the use of statistical inferences based on inaccurate data with respect to African countries.

[5]The model is adapted from various studies that have examined the concept of the Beveridge curve analysis; however, rather than use the curvilinear/convex Beveridge curve, we utilize a linear version, which was derived from equations (2) and (3) because our focus is on the utilization of human capital and not about how vacancies are filled. For detailed analysis and derivation, see Blanchard and Diamond (1989), Mortensen and Pissarides (1994) Hobijn and Şahin (2012), and Elsby *et al*. (2015).

Over the past four decades, the labor market in Nigeria could no longer absorb the rapid graduate turnouts and those who are actively searching for jobs. To see the rate of utilization/employment of graduate human capital in the pre-1978 era when graduates were easily absorbed into the labor market with little search and matching efforts, and now with the proliferation of universities, we incorporate the concept of job creation and job destruction, which follows the Beveridge (1944) curve analysis.

In any economy, job creation and job destruction occur in both the public and private sectors; and in many developing countries worldwide, including Nigeria, the public sector is the major employer in the labor market.[6] According to Blanchard and Diamond (1989), "jobs may disappear forever or temporarily." Furthermore, they assumed that each of the jobs in the economy can produce a gross revenue of either 1 or 0, and that the profitability of each job follows a Markov

Figure 1: The Locus of the Rate of Utilization and Unemployment Rate of Graduates



process in continuous time. Similarly, Mortensen and Pissarides (1994) argued that jobs destruction takes place when a filled job separates and leaves the market. They assumed that each job created or destroyed is characterized by a fixed irreversible technology that produces a unit of a differentiated product whose price is $p + \sigma\varepsilon$. According Mortensen and Pissarides (1994), while p is the product price and σ is the standard deviation of the job-specific component, p and σ are common to all jobs created or destroyed whereas ε is the job-specific idiosyncratic component of productivity that is characterized by a finite upper (ε_u) and a lower (ε_d) support. Furthermore, Mortensen and Pissarides (1994) argued that employers create jobs that have product value equal to the upper support (ε_u) of the price distribution, $p + \sigma\varepsilon_u$, and ε_u is the upper support of the idiosyncratic components of the job created. Jobs are destroyed if the idiosyncratic component (ε_d) of their productivity falls below this critical number. In other words, jobs are destroyed when $\varepsilon_d < \varepsilon_u$; that is, the job destruction equation is expressed as $p + \sigma\varepsilon_d$.

[6]According to Dabalen et al. (2001), about 60 percent of all formal employment is provided by public firms and that additional 30 percent of all formal employees work in firms with joint private and public ownership, thus this leaves just 10 percent of all formal employment in private establishments. They also pointed out that the public sector in Africa has historically been a major employer of university graduates.

In a recent study, Elsby *et al*. (2015) used Pissarides (1985) model by combining the free entry and wage setting conditions to derive the job creation condition, which "takes the form of an upward-sloping ray from the origin, since it prescribes a particular level of the vacancy-unemployment ratio."[7]

In the case of Nigeria, the idiosyncratic components do not apply because the public sector, who is the major employer[8] in the labor market, is a welfare maximizer not bounded by the same constraints, ε_d and ε_u, that firms as profit maximizers consider in their job creation and job destruction decisions. In Nigeria and other African countries where the government is the major employer of university graduates, job creation (*JC*) and/or job destruction (*JD*) will depend on various government policies (*GP*). Algebraically, this can be expressed as:

$$JC = f(GP),\ JD = f(GP), \text{ and } \frac{JC}{JD} = f(GP) \qquad (4).$$

Intuitively, if government policies are pro-job creation, *JC* > *JD* thus, $\frac{JC}{JD} > 1$, and this means that with more job creation, the rate of human capital utilization of university graduates should increase, which may have a positive impact on economic growth. And if government polices lead to more job destruction than job creation, *JC* < *JD* thus, $\frac{JC}{JD} < 1$, this means the rate of human capital utilization would decrease as more jobs are destroyed than jobs created. If jobs created and jobs destroyed are equal, *JC* = *JD*, then $\frac{JC}{JD} = 1$, this means we can incorporate the job creation (*JC*) curve as a 45-degree upward-sloping line in Figure 1 (shown by the dashed line) with intersection at $e = 0.5$ and $u = 0.5$. As shown in Figure 1 (and also in Figure 2), the clockwise and the counter-clockwise rotations of the *JC* curve signify job destruction and job creation, respectively.

The *JC* curve given by equation (4) that we applied in this analysis is based on historical trend and supporting data evidence from various studies which show that the rate of human capital utilization of university graduates in Nigeria was at its highest between 1960 and 1978 when the unemployment rate of graduates was at its lowest in comparison to 2011 (see Eneji *et al*. 2013, Table 3.1, p. 155). Figure 2 shows two rates of utilization of human capital of university graduates in Nigeria. Point A shows that between 1960 and 1978, students who graduated from the few federal universities were gainfully employed, except for those who were frictionally and structurally unemployed.

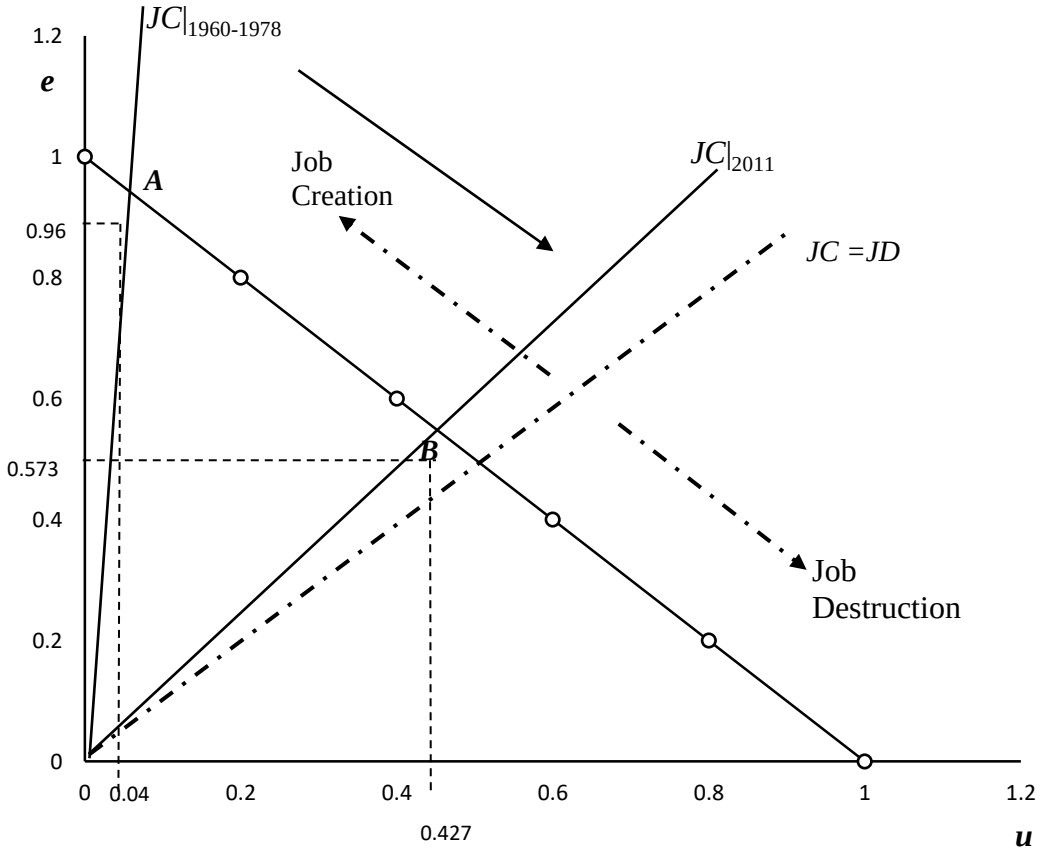
Arguably, the utilization rate of their human capital was at its highest if we assume that the average annual natural rate of unemployment of university graduates was roughly four percent between 1960 and 1978. Point B shows that for periods after the base period (1960-1978), there has been a tremendous increase in the unemployment rate of university graduates (increased from roughly 4% during 1960-1978 to 42.7% by 2011), especially since the 2000s. In order to fully comprehend the clockwise movements of the *JC* curve[9] with the intersection at point B, it is important to show and highlight the importance of job creation and job destruction in Nigeria over the past three or more decades since complex modeling and econometric estimation of this issue would serve no useful purpose to current policymakers in Nigeria if we fail to identify and discuss the underlying causal factors.

[7] For detailed derivation of the job creation and job destruction equations, see Pissarides (1985), Blanchard and Diamond (1989), and Elsby *et al*. (2015).

[8] See footnote 5.

[9] A downward shift of the *JC* curve, within the framework of the Beveridge curve analysis, implies job destruction. Again, for more details, see Pissarides (1985), Blanchard and Diamond (1989), and Elsby *et al*. (2015).

Figure 2: The Rate of Utilization and Unemployment Rate of Graduates in Nigeria, 1960-2011



4.1 Job Creation and Job Destruction in Nigeria, 1960-Present

One can assert that the 1967-1970 Nigerian civil war and the era of reconstruction that followed thereafter created immense job opportunities for workers in general, which facilitated the full-employment and utilization of university graduates and the employment of expatriates to complement these graduates in various sectors of the economy. Investors and entrepreneurs who have tried to start new business ventures that would create jobs in Nigeria would no doubt agree that it is very costly and difficult due to meaningless policy rigidities. This is also true for many other West African countries, or perhaps the entire African continent. A plausible explanation could be that since the governments are the largest employers in these countries; therefore, they try to prevent competition in the labor market. Arguably, government policy rigidities, which began with the National Youth Service Corps (NYSC) Decree No. 24 of 1973 and the Labor Decree of 1974 have contributed enormously to job destruction in Nigeria. These are issues also identified by Shadare and Elegbede (2012) and Eneji *et al*. (2013).

The NYSC was created over four decades ago as a way to promote national unity through annual posting of graduates to regions other than their own so that these graduates would assimilate the cultures in other regions of Nigeria. The unintended consequences of this policy stance are such that employers who are recipients of the NYSC graduates are now "annual free-riders" because they provided with cheap or free labor every year with no incentive to invest in on-the-job training of these graduates. In essence, this could explain why many private employers now claim that Nigerian graduates are ill-equipped for the job market, which could explain their reluctance to hire new graduates. This argument goes against the economic theory of credentialism and signaling. It is important to point out that universities are not vocational and/or middle level technical training institutions whose principal function is to prepare their students for various professional job markets.

According to the marginal productivity (*MP*) theory of inputs, especially the labor factor of production, a university education or a credential/diploma does not impute any graduate with a specific level of *MP*, which would satisfy what each employer needs in the labor market; rather it signals that a university graduate should possess certain attributes: trainability and adaptability if and when hired. Obviously, the low quality of education is a global phenomenon; therefore, attributing graduate unemployment to the quality of university education in Nigeria is a flawed excuse by employers who no longer invest in on-the-job training (which could be firm-specific) because the NYSC provides oil companies, commercial banks, and other private organizations the opportunity to "free-ride" since they obtain annual deployment of cheap labor from university graduates.

The Labor Decree of 1974 also contributed to the rising unemployment of university graduates in Nigeria during the late 1970s and the early 1980s. In the attempt to comply with the provisions of this decree, which protects older workers from layoff in cases of redundancies, employers became hesitant to hire new workers, thus the negative impact on the recruitment new university graduates into their workforce.

Apart from the two policy rigidities identified above, there are many industries and/or sectors of the economy through which jobs have been destroyed in Nigeria since the late-1970s. First, the energy-electricity sector of Nigeria is a major sector through which jobs have been destroyed since the early 1980s. For more than three decades, the production of electricity in Nigeria is, perhaps, the worst anywhere in the world. The inability to supply uninterrupted electricity has destroyed jobs for graduates who majored in civil, electrical, and mechanical engineering from various universities and polytechnics in Nigeria. More importantly, one cannot overemphasize the significance of the electricity supply to all sectors of the economy and ultimately economic growth and sustainable development. Are these university graduates so ill-equipped to work in the power sector if the sector has been in state of comatose over the past three decades with no perceived solutions, and now, the energy sector is completely destroyed overwhelmed, and totally overtaken by the generator monopolist who imports very low quality environmental-polluting generators from other countries?

Second, many jobs have also been destroyed in Nigeria's transportation industries, namely aviation, road and railroad, and water and/or sanitation. In the 1960s and 1970s, pilots of the defunct Nigeria Airways[10] were regarded as some of the best trained and equipped in the aviation industry, worldwide. For many years, the aviation industry provided job opportunities for graduates from various disciplines ranging from aeronautic engineering, accounting, management, computer science, and others. The destruction of the Nigeria Airways meant the destruction of jobs for graduates in these and other related disciplines. Next, the road and railroad industries have also suffered similar fate in terms of job destruction in the past four decades. Again, in the 1960s and 1970s, the Nigerian Railroad Corporation (NRC) covered the three major regions (East, North, and West), but more importantly, the NRC provided an efficient means of transportation of goods and services throughout the country, thus providing job opportunities for railroad engineers and technicians from various universities and polytechnics until the late-1970s and early 1980s when suddenly the rail-tracks and many train-stations became underutilized and/or abandoned.[11]

Third, another avenue of job destruction in Nigeria was the water supply system, which provided pipe-borne water to many towns and cities. For many decades, the Waterworks Departments (WDs) provided uninterrupted water supply to medium-sized and big towns and all major cities in Nigeria. These WDs did not only provide water supply to residents of these towns and cities, they also provided job opportunities for fresh graduates in different disciplines. Today, towns and cities in Nigeria suffer from lack of water supply due to the defunct WDs with millions of jobs destroyed in the process.[12] It is impossible to quantify the multiplier effects of the jobs destroyed in the industries identified above. Fourth, jobs have also been destroyed in the agricultural sector of the Nigerian economy.

[10] For more on the historical acquisition of airplanes and the disappearance of the fleet of 61 planes and ultimately the defunct Nigeria Airways, see https://www.planespotters.net/airline/Nigeria-Airways.

[11] There are many abandoned and/or unfinished projects that could have strengthened Nigeria's weak industrial and manufacturing base and thus create jobs. In the 1970s, there was increased emphasis on the oil industry due to the oil-boom and less on coal, mining, iron-ore, and oil refinery industries. For example, the Ajaokuta Steel Plant, established under Section 2 of the National Steel Council Decree No. 60 of 1979, was designed to be the bedrock of Nigeria's industrialization; and almost four decades later, Nigeria is yet to gain from its multi-billion dollars investment in the steel plant.

[12] The health implications with respect to water-borne diseases since then are beyond the scope of this paper.

In the 1960s and 1970s, there were many "Agricultural Farm Settlements," that were not only the sources of cheap agricultural products – both locally produced and imported – but they also provided job opportunities for graduates in agricultural science and other related disciplines such as animal husbandry. These farm settlements have also disappeared or have been abandoned with many jobs also destroyed in the process.

Putting equations (1)–(4) together based on the discussion above, we can therefore assert that the rate of human capital utilization depends upon the unemployment rate, which in turn depends on government policies, the job creation and job destruction processes or the ratio of both. This, we can express algebraically as:

$$e = f\left(u\left(GP, \frac{JC}{JD} = g(GP)\right)\right) \qquad (5)$$

where *e* is the rate of human capital utilization and *u* is a measure of graduate unemployment rate as defined in equation (3), and *u* is different from and higher than the national unemployment rate; *JC*, *JD*, and $\frac{JC}{JD}$ are as defined in equation (4) above. Simply put, equation (5) states that unemployment rate as well as job creation and job destruction depend on government policies. From our discussion above, the NYSC of 1973, the Labor Decree of 1974, and import[13] restrictive policies are examples of *GP* that influenced *u*.

Given that the annual unemployment rate of graduates continued to increase and the fact that the current 162 universities in Nigeria cannot accommodate the explosive public demand for university education, the issue for theoretical/empirical consideration is how the utilization of human capital affects economic growth. Given the problem of data collection with respect to graduate unemployment rate, a descriptive-algebraic analysis will suffice.

4.2 The Impact of Human Capital Utilization on Economic Growth in Nigeria

Early growth theories emphasize the importance of capital accumulation in the growth and development process; and recent growth theorists now emphasize the importance of the initial levels of education or human capital as well as the investment in physical capital and/or its accumulation in economic growth and development. To show the impact of human capital utilization on economic growth, we reproduce the conventional growth equation in two different Cobb-Douglas production functions: one includes the *stock* of human capital (*H*) and the other includes the *flow* or utilization of human capital (*eH*). These equations are:

$$y_t = A_t K_t^{\alpha} L_t^{\beta} H_t^{\gamma} \varepsilon_t \qquad (6)$$

and

$$y_t = A_t K_t^{\alpha} L_t^{\beta} (eH)_t^{\gamma} \varepsilon_t \qquad (7)$$

where *y* is per capita income, *L* is labor, *K* is physical capital, and *H* is the *stock* of human capital while *eH* is the *flow* of human capital or the rate of human capital utilization (the percentage of workers with human capital actually employed in the production process), and ε is the error term.[14]

According to Jenkins (1995), *H* in equation (6) is the *stock* of human capital, measured in workforce qualifications, which she interpreted to mean that "highly-qualified workers can be up to twice as productive as those with no qualifications" or human capital. This explanation is consistent with the interpretation of many early studies such as Nelson and Phelps (1966), Lucas (1988), and Barro and Sala-i-Martins (1995). We hasten to add that the implicit assumption inherent in equation (6) is that every graduate (in the case of Nigeria) with human capital (*stock* of human capital) is employed, and therefore, they would contribute positively to output growth. Our contention with the growth equation as expressed in equation (6) is that growth regressions using the entire *stock* of human capital implicitly assumes full or total utilization of all human capital. In some studies, regression analysis simply uses total enrollment in primary and secondary schools, and tertiary education as their measure of human capital in developed and developing countries. Whatever the measure of human capital used: stock or total enrollment at all educational institutions, one can argue that no country, including the United States, fully employs or utilizes human capital acquired.

[13] Government policies also banned importation, which destroyed jobs in the retail industry. Large retail stores such as Kingsway, United Trading Company (UTC), Leventis, Challarams, and many others went out of business.

[14] For equation (6), see Benhabib and Spiegel (1994).

In other words, the rate of human capital utilization (we consider *e* as a measure of the *flow* of human capital into aggregate production) matters more than the *stock* of human capital because not everyone human capital acquired in different forms is utilized in the production process.

If we assume that not every graduate with human capital is utilized or absorbed into the labor market due to the fact that frictional and structural unemployment exist at full-employment unemployment; therefore, we can rewrite the conventional equation (6) to reflect the actual utilization of human capital in Nigeria for the 1960-1978 base period (point *A* in Figure 2) as:

$$y_t\big|_{1960-1978} = A_t K_t^{\alpha} L_t^{\beta} (e_{1960-1978}) H_t^{\gamma} \varepsilon_t \qquad (8).$$

Similarly, we rewrite equation (6) to reflect the actual human capital utilization rate in Nigeria in 2011 (point *B* in Figure 2) as:

$$y_t\big|_{2011} = A_t K_t^{\alpha} L_t^{\beta} (e_{2011}) H_t^{\gamma} \varepsilon_t \qquad (9),$$

and dividing equation (9) by equation (8) yields the ratio of per capita income for both periods:

$$\frac{y_t\big|_{2011}}{y_t\big|_{1960-1978}} = \frac{A_t K_t^{\alpha} L_t^{\beta} (e_{2011}) H_t^{\gamma} \varepsilon_t}{A_t K_t^{\alpha} L_t^{\beta} (e_{1960-1978}) H_t^{\gamma} \varepsilon_t} = \frac{e_{2011}}{e_{1960-1978}} \qquad (10).$$

Interpretatively, equation (10) states that the annual ratio of (or difference in) per capita income depends of the ratio of human capital utilization. In this illustration, we use 1960-1978 as the base or reference period with which to compare other years because as we pointed out earlier, there was manpower shortage during the 1960s and early 1970s, and as a result, students from the first and second generation universities had easy access to various types of "vacation/summer jobs," while their graduates were complemented by the employment of foreign expatriates, thus the utilization of human capital was at its highest and unemployment rate of graduates was at its natural rate.

Table 1: Graduate Unemployment and Utilization Rates, Change in Utilization and e_{ratio}, 1979-2011

Year	*u*	*e*	$\Delta e = e_{\|current} - e_{\|1960-1978}$	e_{ratio}
1979-2002	*NC*	*NC*	*NC*	*NC*
2003	0.256	0.744	– 0.216	0.775
2004	0.380	0.620	– 0.340	0.645
2005	0.323	0.677	– 0.283	0.705
2006	0.322	0.678	– 0.282	0.706
2007	0.321	0.679	– 0.281	0.707
2008	0.375	0.625	– 0.335	0.651
2009	0.390	0.610	– 0.350	0.635
2010	0.435	0.565	– 0.395	0.589
2011	0.427	0.573	– 0.387	0.597

Source: Column 2 obtained/adapted from Eneji *et al*. (2013, Table 3.1), and authors' computation using equations (3) and (10); and *NC* = Not computed due to unavailable data.

Based on equations (3) and (10) and using the available annual unemployment rate data of university graduates obtained from Eneji *et al*. (2013, Table 3.1, p. 155), we compute *e*, the change in *e* in reference to the base period ($\Delta e = e_{|current} - e_{|1960-1978}$), and e_{ratio}. Column 2 of Table 1 shows that the graduate unemployment rates increased between 2003 and 2011, and column 3 shows the decrease in the rate of utilization from 74.4 percent in 2003 to the lowest utilization rate of 56.5 percent in 2010. Furthermore, the change in *e* (Δe) was negative throughout the 2003-2011 period when we subtract the base period *e* (1960-1978) from the recently available unemployment rate data for university graduates in column 2. The last column (e_{ratio}) shows that the utilization rate in 2003 was only 77.5 percent of the utilization rate of the base period, and 2010 was the lowest utilization rate in comparison to the same base period.

5. Conclusions and Policy Implications-Recommendations

Studies of graduate unemployment in Nigeria have postulated different causal factors and many of these studies conclude that the proliferation of universities since the late 1970s and early 1980s created unplanned oversupply of graduates with the attendant low quality issues. Some studies attributed the low quality of university education in Nigeria to many irrelevant curriculum, shortage of modern learning resources or facilities, inadequate financing by federal and state governments, and that poor quality staff will always produce poor quality graduates. The general consensus from these studies is that Nigeria has abundant university trained labor than the economy's absorptive capacity.

In this study, we focus exclusively on the rate of utilization of human capital of university graduates because the consensus among studies is that the unemployment rate of university graduates in Nigeria is much higher than the national average thus the model we use and the measurement methodology can be applied to the aggregate human capital utilization. We highlight Nigeria's rapid accumulation of human capital at the university level since the mid-1970s in order to emphasize that if a country cannot utilize all its manpower in critical skill areas due to the low absorptive capacity of its labor market, the rapid accumulation of human capital will not translate into economic growth. Even though it is difficult to obtain time series data of graduate unemployment rates dating back to 1960 in order to compute the rate of utilization of human capital (e), the change in e (Δe) in reference to the base period (1960-1978), and ratio of e (e_{ratio}), the 2003-2011 period reported in Table 1 shows that the utilization rate decreased as graduate unemployment rate increased. Also, the change in utilization rate in comparison to the base period was consistently negative. More importantly, the e_{ratio} for 2003-2011 period tells us that Nigeria has not been able to achieve the human capital utilization rate it once achieved during the 1960-1978 base period.

The rising unemployment rate of graduates since the 1980s calls into question the wisdom of the federal and state governments and the private sector in establishing more universities if the economy or its labor markets cannot absorb and utilize the current turnouts of its graduates. In addition, the increasing unemployment rate of graduates should signal to the federal and state governments to revisit and reexamine their policies that have contributed to job destruction in the public and private sectors of the economy; and to ensure that future policies are pro-job creation. In other words, all stakeholders must address the issue of rising unemployment rate of graduates because of the dire economic and socio-political consequences if highly-trained university graduates continue to remain unemployed. The simplest policy recommendation is a comprehensive national and state *infrastructure revitalization programs* (in compliance with world standards) in order to bring back some of the jobs destroyed, and strong infrastructures are crucial in attracting foreign direct investments as additional sources of creating new jobs.

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