

EFFECT OF FUNDING ON THE EFFICIENCY AND PERFORMANCE OF NIGERIAN UNIVERSITIES

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Abstract

The importance of funding in the delivery of quality and efficient university education cannot be overemphasized. It is against this background that this study examined the effect of funding on the efficiency and performance of Nigerian universities. Descriptive statistics and Data Envelopment Analysis (DEA) techniques were used to analyze data from 121 universities spread among four categories of owners (40 Federal, 30 States, 29 privates and 23 faith-based) in Nigeria. Data for the study were based on the year 2017 and were sourced from the Nigerian University System Statistical Digest and The State of Nigeria Universities both of the National Universities Commission. Results reveal that only 19 universities are technically efficient of which 12 are federal universities while 5 belong to the state governments. Funding was established to be a major factor affecting the performance of the universities, while federal universities and especially those from the North Central zone of the country were found to be better in terms of funding than those from other parts. Strategies that increases fund to Nigerian universities without compromising the qualities must be embraced by the stakeholders to reposition Nigeria universities for optimum performance and efficiency and also make them to become globally competitive.

Keywords: *Efficiency, Nigeria, University, Funding, Data Envelopment Analysis*

1.0 Introduction

Education is widely accepted as a major instrument for promoting socio-economic, political and cultural development in Nigeria. Universities educate future leaders and develop the high-level technical capacities that underpin economic growth and development (Odekunle, 2001). Essentially, much funding is needed to enable education effectively play this role. However, this is usually emphasized albeit as mere rhetoric in every government and non-government forum on education (Ugwoke, 2013).

According to Agha (2014), funding university education in Nigeria has always been the responsibility of both the state and federal government. The consequence of this is the neglect of certain sectors of education. This results in shortage of funds and lean resources in the university system. Without effective funding, universities will not be able to discharge their statutory functions especially in the development of a nation (Ahmed, 2001).

The smooth running of any educational institution depends largely on the availability of resources, be it human, material or financial. These resources also determine to a large extent the achievement of the set goals of any organisation. Ozigi and Canham (1979) opined that no organization can carry out its functions effectively without adequate financial resources at its disposal. Funding which represents financial resources plays a vital role in the development of universities. Therefore, the funding of education is a vital area of Economics of Education (Akangbou, 1986).

Mgbekem (2006) as cited in Agha (2014) reveals that the major challenge facing the management of university system in Nigeria is inadequate funding. Ajayi and Ekundayo (2006) assert that the Nigerian government over the years has not been meeting the United National Educational Scientific and Cultural Organization (UNESCO) recommendation of 26% of the total budget allocation to education sector and in spite of the various intervention areas by TETFUND, there still exist poor educational facilities in Nigeria.

It is worrisome to note that Nigerian universities are fast decaying. All the resources required for education production process are in short supply. Lecture halls, laboratories, students' hostels, library space, books and journals and office spaces are all seriously inadequate (Mgbeken, 2006). World Bank (2009) in Agha, (2014) collaborates that equipment for teaching, research and learning are either lacking or very inadequate and in a bad shape to permit the universities the freedom to carry out the basic function. Nigeria government's priority to universities in terms of funding has declined and this has limited the ability of the universities to effectively and efficiently perform their duties, particularly the traditional roles of teaching and research (Bamiro and Adedeji, 2010). The problem of underfunding of

Nigeria universities is a consequence of the expansion of the system in response to the growing demand for university education and the intensifying needs of modern economy driven by knowledge, without an increase in the corresponding rates of available resources.

In this era of globalization and massification of education, Nigeria cannot afford to run a university system that compromises quality if she is to compete in the global economy. In order to meet the challenges of the 21st century and absolute internalization, there is the need for education to imbibe the global culture and adopt ardent consideration of development in line with the current technological trends.

Since globalization has occasioned changes in educational pivot role, proved by the fact that contemporary Nigerian education is busy grappling with how to develop strategies that would help in the production of knowledge-based citizens ready to meet the global challenges, there are bound to be changes in educational processes and methods. One of such areas is that of educational funding and financing. Having admitted that education is an instrument for the enhancement of the socio-economic advancement and viability of any nation, changes in educational funding and financing strategies in Nigeria have in fact become imperative. The traditional lip-services, poor funding, and embezzlement of funds meant for educational services and development must now become things of the past.

The essence of funding universities education is to ensure it has minimum acceptable qualities. Once the funding of university education is compromised, quality can no longer be assured and this will be seen in the low quality university turn-outs. Quality in education according to Nwana (2000) refers to the scale of input in the form of funds, equipment facilities, teacher and pupils alike and to the fact that the transaction and output of institutions in the form of their product are acceptable, desirable, beneficial, efficient and effective from the point of view of the government, society, private agencies and stakeholders.

Igwe (2007) sees quality in higher education to cut across policy formulation to implementation of educational process covering the scope of curriculum; teaching/learning process; resources and facilities; students and teachers environment. Again, Igwe (2007) perceives quality in education as “better school environment, more qualified teachers, and adequate supply of textbooks ... relevance to social needs.

Quality is therefore considered as the baseline standard in education, which can be measured on a scale of preference, hence quality is an expression of standard or the mean by which a certain set of standards in education can be achieved (Maduewesi, 2002).

The justification for a sound and quality university education cannot be overemphasized. Education is a basic activity of mankind because it is the process by which human beings acquire effective knowledge and skills. The concern for quality in university education in Nigeria is most desirable for the economic, political scientific and technological development and advancement of any nation.

University education is expected to create needed human capital with enhanced skills that can lead to technological innovation, productivity and growth within the economy (Olaniyan, 2001). The quality of human capital has direct impact on the development or otherwise of a system, nation building inclusive. Hence, university education is specially designed to provide the needed manpower for the overall turn around of a nation. Generally, education, and particularly university education, is fundamental to the construction of a knowledge economy and society in all nations (World Bank, 1999).

It is against this background that this research seeks to examine the direct and indirect effect of funding on the efficiency and performance of selected Nigerian universities. The remainder of this paper is organized as follows: Section 2 explained the methodological approach adopted by the study. The results and discussions are presented in section 3 while Section 4 gives Summary and Policy recommendations from the study

2.0. Analytical Techniques

Two approaches were adopted in this study; a descriptive statistics and inferential statistics. Descriptive statistics such as tables, means, median, standard deviations to examine some selected components of funding among selected Nigeria universities and how these affected their performance for the year under study while the inferential statistics was carried out using Data Envelopment Analysis (DEA) to examine the efficiency values of selected Nigerian universities.

2.1 Data envelopment analysis

The DEA approach adopted in this study is as obtained in Binuomote *et al* (2020). It was explained that in broad terms, DEA technique defines an efficiency measure of a production unit by its position relative to the frontier of the best performance established mathematically by the ratio of weighted sum of outputs to weighted sum of inputs. Norman and Stoker (1991) and Coelli (1996) provide a detail description of DEA technique. The estimated frontier of the best performance is also referred to as efficient frontier or envelopment surface. The frontier of the best performance characterizes the efficiency of production units and identifies inefficiencies based on known levels of attainment. For instance, a production unit attains 100% efficiency only when it is not found to be inefficient

in using the inputs to generate the output when compared with other relevant production units. The original formulation of the DEA model was introduced by Charnes, Cooper and Rhodes (CCR) (1978), and it assumes constant return to scale (CRS) and the production frontier is a piecewise linear envelopment surface. In order to fix the idea, given that

$S = \{1... s\}$ is the set of outputs considered in the analysis

$M = \{1... m\}$ is the set of inputs considered in the analysis

y_{rj} = known positive output level of production unit j , $r \in S$

x_{ij} = known positive input level of production unit j , $i \in M$

n = total number of production units evaluated

An interpretation of the CCR model that estimates the proportional increase θ , in all outputs required to achieve efficiency in DMU 'k' is given by

$Min \mu_k$

Subject to

$$\sum_{j=1}^n \lambda_j y_{rj} \geq y_{rk} / \mu_k, r = 1, 2, \dots, s$$

$$\sum_{j=1}^n \lambda_j x_{ij} \leq x_{ik}, i = 1, 2, \dots, m$$

$$\lambda_j \geq 0, j = 1, 2, \dots, n \quad (1)$$

The variables in the CCR model are μ_k , and λ_j . The sufficient condition for efficiency of DMU 'k' is that the optimum value of μ_k is 1. Otherwise, it is regarded as inefficient when compared to other DMUs in the sample. The constraints in the model ensure that relative technical efficiency of DMU 'k', given by μ_k never exceeds 1. Usually, in the CRS model, the technical efficiency estimated with input and output orientation is the same and the optimal value of μ will be the Farrell (technical) efficiency. A DEA run involves solving the above model n times, once for each DMU analyzed. The measure of efficiency obtained from the solution to model (1) consists of two components: 'pure' technical efficiency and scale efficiency. Banker, Charnes and Cooper (BCC) (1984) proposed the variable-returns-to-scale (VRS) version of the model (1). The BCC model is (1) together with the additional constraint

$$\sum_{j=1}^n \lambda_j = 1 \quad (2)$$

which captures returns to scale characteristics. Hence, the efficiency estimates obtained in the BCC model is net of the contribution of scale economies and therefore is referred to as 'pure' technical efficiency and also as the managerial efficiency. The model given in (1) is output-oriented since it provides information as to how much equi-proportional increase in

output is necessary (while maintaining levels of input) for an inefficient unit to become DEA-efficient. Under CRS specification, input and output orientation provides identical DEA estimates. Moreover, the efficiency frontier estimated with input and output orientation DEA models is the same. Generally, the purpose of an input-oriented example is to study the amount by which input quantities can be proportionally reduced without changing the output quantities produced. Alternatively, and by computing output-oriented measures, one could also try to assess how much output quantities can be proportionally increased without changing the input quantities used. The two measures provide the same results under constant returns to scale but give different values under variable returns to scale. Nevertheless, since the computation uses linear programming, which is not subject to statistical problems such as simultaneous equation bias and specification errors, both output and input-oriented models will identify the same set of efficient/inefficient producers or DMUs. The VRS technology usually envelops data more closely than CRS technology, and consequently, VRS technical efficiency scores are greater than or equal to CRS technical efficiency scores. The advantages of the VRS model outweigh the increase in computational power necessary to solve the model, which allowed the VRS to gain popularity over the CRS method (Fried *et al.* (2002), Coelli *et al.* (1998)).

2.2 Empirical Specification

In this study, DEA method was used to analyze the efficiency of universities in Nigeria. Based on the DEA methodology, to analyze the efficiency of the universities in Southwestern Nigeria, it is assumed that each university (DMU – Decision Making Unit) may be characterized by its initial assets (system input), effects (results, system output) and production processes, which transform assets into effects controlling for environmental factors (variables out of university's control).

2.3 Data and Measurement Issues.

Data for this study were primarily sources from the National Universities Commission the body officially saddled with the responsibility and coordination of university education in Nigeria. Specifically, the data were extracted from two official publications of the National Universities Commission viz *Nigerian University System Statistical Digest (2017)* and *The State of Nigeria Universities (2017)*

The focus of this study is all universities Nigeria, which include those owned by the government and that include the as well as the private universities. The universities dropped from the analysis are those with insufficient information for the year of study. A total of One hundred and twenty –one universities were considered for the study. Of this number, thirty-nine (39) are owned by the federal government, thirty (30) are owned by the state

governments, twenty-nine (29) are owned by individuals and private organizations while the remaining twenty-three (23) are owned by missions (that is their ownership are religious organization-based)

While some studies have analyzed different types of efficiency such as teaching and research efficiency, it is important to state that the variables selection plays one of the crucial role for DEA analysis. Türkan and Özel, (2017) showed a wide range of indicators used by researchers to study efficiency of universities, the unavailability of information or database on research publications of Nigeria university lecturers makes it difficult to assess the research efficiency; therefore the main focus of this study is on the teaching efficiency.

The combinations of the inputs with the fixed mix of the outputs which was used to estimate the efficiency of Nigeria universities in this study and which was considered as the best mix is described in the table below. The model was analyzed using the input-oriented approach of the Data Envelopment Analysis component of the R – Studio statistical package.

Table 1: Model Variables

Type of Variable	Description	measurement
Input	Government/ Owner Subvention	Naira
Input	Internally generated revenue	Naira
Input	University running cost	Naira
Input	Internet wifi supply	Ratio
Input	Number of academic programmes	Number
Input	academic teachers	Number
Input	Student/staff ratio	Number
Output	Undergraduate students enrollment	Number
Output	Postgraduate students enrollment	Number

3.0 Results and Discussions

3.1 Descriptive Statistics

3.1.1 Descriptive Statistics for Efficiency Analysis of Nigerian Universities

The inputs and outputs employed in this study are based on the production approach. Nigeria universities like those in other parts of the world combine both labour and non-

labour factors of production to generate outputs which are usually in the form of teaching, research and educational services and research outputs.

The variables included in this analysis are as follows: undergraduate enrollment, postgraduate enrollment, type of university, student to staff ratio, number of programmes, number of internet hours per day, operating expenses and government/owner subvention. Some reported statistics for the study are as presented in Tables 2 and 3. A total of one hundred and twenty one universities in Nigeria were considered for the study and they were distributed along the Nigeria's geopolitical zones (which are South-West, South-East, South-South, North-West, North –East, North-Central and the Federal Capital Territory (FCT)) and the types of university (viz federal universities, state universities and private universities – which are also classified as mission-based universities and those privately owned by individuals or organizations that are not mission- based). The inputs for the measure of efficiency of Nigerian universities earlier stated are hereafter described along the geopolitical location of the university and the type of the university.

Descriptive Statistics of Input Variables for Nigeria Universities along the Geopolitical Zones and types of universities.

The descriptive statistics on the inputs and outputs variables, reported in Tables 2 and 3, revealed marked differences both between and within the universities in their various geopolitical zones and the universities types as indicated by the mean and standard deviation values.

Undergraduate Enrollment

On the average, the universities in the federal capital territory (FCT) of Nigeria have the highest undergraduate enrollment in 2017. The mean undergraduate enrollment for universities domiciled in the FCT is sixty-one thousand (61,000). This figures though look surprising, it is a reflection of students in the National Open University of Nigeria (NOUN) which has its headquarters in the FCT. By implication, NOUN has more undergraduate students enrollments more that all the other universities in Nigeria when put together. The South-South (with mean undergraduate students' enrollments of 15,500) has the highest number of undergraduate enrollments after the FCT. The South- West universities have the least average undergraduate enrollments as shown in Table 2.

Table 2: Descriptive Statistics for Funding Components of Nigerian Universities by Geopolitical Zones location

	FCT (n=7)	NC (n=15)	NE (n=9)	NW (n=15)	SE (n=24)	SS (n=11)	SW (n=40)	Overall (n=121)
uenroll								
Mean (SD)	61000 (146000)	12800 (12700)	12600 (14500)	10900 (12000)	11900 (13900)	15500 (11500)	6720 (10200)	13300 (36600)
penroll								
Mean (SD)	12000 (29500)	871 (1360)	1840 (2940)	1760 (2940)	1630 (2770)	915 (1190)	1040 (2350)	1900 (7400)
ssr								
Mean (SD)	0.419 (0.457)	0.371 (0.721)	0.318 (0.396)	0.231 (0.215)	0.444 (0.517)	0.197 (0.115)	0.383 (0.406)	0.353 (0.442)
wifi								
Mean (SD)	Mean (SD)	15.1 (9.58)	17.9 (7.39)	16.3 (10.5)	16.2 (8.90)	16.9 (9.77)	16.6 (10.0)	17.3 (9.13)
subv								
Mean (SD)	2.75e+09 (1.75e+09)	1.28e+10 (3.84e+10)	3.56e+09 (3.43e+09)	3.93e+09 (3.73e+09)	4.01e+09 (3.88e+09)	9.23e+09 (1.14e+10)	5.98e+09 (1.73e+10)	6.04e+09 (1.68e+10)
igr								
Mean (SD)	3.17e+09 (4.13e+09)	1.96e+09 (2.52e+09)	2.45e+09 (2.63e+09)	2.04e+09 (2.37e+09)	1.93e+09 (2.39e+09)	2.13e+09 (2.48e+09)	2.15e+09 (2.4e+09)	2.18e+09 (2.51e+09)
prog								
Mean (SD)	34.0 (20.6)	35.6 (24.4)	36.1 (19.1)	34.0 (23.1)	43.4 (27.8)	52.6 (29.3)	30.0 (20.5)	36.6 (24.0)
runcost								
Mean (SD)	3.98e+09 (2.87e+09)	1.44e+10 (3.81e+10)	2.91e+09 (3.39e+09)	3.94e+09 (3.73e+09)	5.01e+09 (5.4e+09)	9.66e+09 (1.12e+10)	5.45e+09 (1.55e+10)	6.3e+09 (1.63e+10)

Source: Authors' calculation, 2019

When consideration is given to the types of university in studying the patterns of undergraduate enrollments, Table 3 reveals that the universities owned by the Federal Government of Nigeria otherwise known as the federal universities have the highest undergraduate students' enrollments (with a mean value of 28,200). Private universities in Nigeria have the lowest numbers of undergraduate enrollments in 2017 with an average size of 2,060. In Nigeria, the cost of education in universities owned by the federal governments is generally lower when compared to state and private universities. While the federal government largely subsidizes the costs of education in universities own by it, state governments share a burden of the funding on the students while private universities are fully commercialized and students have to bear the full burden of the cost of education. This largely explains the patterns of undergraduate enrollments among the federal, state and private owned universities.

Table 3: Descriptive Statistics for Efficiency Analysis of Nigerian Universities by Institutional Ownership

	Federal (n=40)	Private (Mision-based) (n=23)	Private (n=29)	State (n=30)	Overall (n=121)
Uenroll					
Mean (SD)	28200 (60600)	1840 (2060)	2050 (3260)	13200 (10600)	13300(36600)
Penroll					
Mean (SD)	4700 (12500)	272 (569)	209 (586)	1070(1510)	1900 (7400)
Ssr					
Mean (SD)	0.206 (0.173)	0.446 (0.556)	0.670 (0.607)	0.170 (0.115)	0.353 (0.442)
Wifi					
Mean (SD)	18.2 (9.21)	17.3 (9.47)	19.7 (8.30)	14.1 (8.96)	17.4 (9.12)
Subv					
Mean (SD)	8.64e+09 (2.27e+10)	1.95e+09 (2.3e+09)	2.64e+09 (2.13e+09)	3.18e+09 (2.31e+09)	6.04e+09 (1.68e+10)
Igr					
Mean (SD)	2.51e+09 (2.5e+09)	2.08e+09 (2.38e+09)	1.88e+09 (2.76e+09)	2.09e+09 (2.44e+09)	2.18e+09 (2.51e+09)
Prog					
Mean (SD)	50.5 (28.5)	22.8 (11.5)	23.5 (10.9)	41.4 (22.2)	36.6 (24.0)
runcost					
Mean (SD)	9.46e+09 (2.27e+10)	2.28e+09 (3.15e+09)	3.65e+09 (1.95e+09)	3.88e+09 (2.7e+09)	6.3e+09 (1.63e+10)

Source: Author calculation, 2019

Postgraduate Enrollment

The pattern of postgraduate enrollment in Nigeria universities is not too different from what obtains with the undergraduate enrollment in the different geo-political zones of the country. The Universities domiciled in the FCT has the highest numbers of enrolled postgraduate students. The average postgraduate enrollment is 12,000. A careful look at this on Table 2 shows that universities in the North -West geopolitical zone of Nigeria follows those in the FCT in postgraduate enrollments while universities in the North-Central geopolitical zone have the least postgraduate enrollments. The average enrollment in this zone in 2017 is 871 students.

Expectedly, the federal universities have the highest numbers of postgraduate enrollments. The average value is 4700 while the state universities have an average of 1070 students enrolled in postgraduate programmes in the year 2017.

Staff to Student Ratio

The productivity of any organization directly depends on the number and quality of personnel in that organization. Size and complexity of any organization will also determine its number of staff. In the university system, a combination of academic and non-academic staff makes up the workforce of the system. This is not different for Nigerian universities. Staff to student ratio enhances efficiency of teaching, research as well as learning by the students. The distribution of staff to student ratio in Nigerian universities for 2017 is shown in Tables 2 and 3. An analysis of this ratio shows that South – East universities have the

highest staff to student ratio with an average value of 0.444. This is followed by Universities in the FCT. The average staff to student ratio in the FCT is 0.419. Universities in the South – South part of Nigeria has the lowest staff to student ratio of 0.197.

The federal and states universities in Nigeria have low staff to student ratio when compared with private universities. Private universities that are not mission-based have a staff to student ratio of 0.670 while mission-based private universities in Nigeria have a staff to student ratio of 0.446. State universities have ratio of 0.170 while federal universities have a ratio of 0.206. Students' enrollments are usually higher in public universities where many of the universities are also under-staffed. Private universities on the other hand usually have low enrollments but with relatively adequate number of staff.

Number of Academic Programmes

The distribution of academic programmes offered by the Nigerian universities in the year 2017 is presented in Tables 2 and 3. On the average, universities in the South-South geopolitical zone of Nigeria offered the highest number of academic programmes in 2017 followed by those in the South-East region. Universities in the South-West have the lowest number of academic programmes on the average.

Federal universities have the highest average number of academic programmes; while the private universities have the lowest with some offering as low as 5 academic programmes that year. Meanwhile the average number of academic programmes offered by the state universities in Nigeria in 2017 is 41. This finding supports the position of Ahunaya and Osakwe (2012) who posit that whereas public universities in Nigeria provide wide-ranging academic programmes (Erinosho, 2007), private ones on the other hand are principally interested in market-driven courses. Nigerian private universities concentrate on courses that do not necessitate huge investments in equipment and research facilities (Suspitin, 2003; Bernasconi, 2003).

Internet Hours per day

The Internet is without dispute one of the most important technological developments of the century we are in. The benefits of internet as a tool to learning, teaching and research cannot be over emphasized. The internet and its services play an important role on the students' and staff performance through constant exposure of students and staff alike to up-to-date information and relevant information in their various fields of study and research. The availability and the number of hours spent on the internet will undoubtedly have effect on the students and staff performance alike. The need therefore to examine the distribution of internet hours per day in Nigeria universities.

On the average, universities in the FCT and North- Central geopolitical zone of Nigeria, have the highest number of internet hours per day. Universities in these zones as Table 3 shows have up to 18 hours of internet services per day while the universities domiciled in the North-East have the lowest internet hours of about 16 hours per day. It is interesting to report that in all the geopolitical zones of Nigeria, the least internet hours per day is 16 hours.

Meanwhile private universities have the highest average internet hours of about 20 hours per day while state universities in Nigeria have the lowest average internet hours of 14 hours per day.

Government/ Owners' Subvention

Funding unarguably is a key element to the survival, sustenance, success and development of any universities and other academic institutions anywhere across the globe. Adequate funding without doubt will serve as a panacea for the effective running of universities, meeting up with the obligations of salaries and welfare of staff, for provision of state of the art facilities for teaching, research and innovation as well as community services. Where there is adequate funding, smooth academic running of a university is guaranteed and the quality of output of such university can be guaranteed. Where funding is compromised, the consequence is always fatal both on the students, staff as well as the nation which will be at the receiving end.

For the year 2017, Table 2 shows that universities in the North-Central part of Nigeria are the most funded. On the average, a total of about thirteen billion naira (N13b) was released as government subvention to fund a university in that zone. Universities domiciled in the FCT are the least funded in the year 2017.

Federal universities received the highest funding in the year 2017. On the average, a federal university in Nigeria received about nine billion naira (N9b) in funding. This is followed by private universities where each private university (which is not mission-based) received an average of about three billion naira (N3b) from their owners. Mission-based universities received an average of two billion naira (N2b) from their owners in 2017. The results from this study show that although the funding of state universities in Nigeria is very bad relative to the Federal Government owned universities, it is a bit better than the private universities. While it may appear that the funding of the private and state universities in Nigeria are very close and so one should expect the same service delivery from them, a careful look at the staff to student ratio of the two class of universities will reveal that bulk of the finances of the state

universities will go to provision of facilities for students which most of the time leaves little for staff welfare and development. The latter we all agree is always the root cause of incessant crisis in Nigeria public universities.

Operating Expenses

The distributions of the operating expenses for Nigerian universities are shown in Table 2 and 3. The interesting pattern observed from this table is that except for the universities in the North-East zone of Nigeria, the subvention given to the universities in all the other geopolitical zones is below their operating expenses. It is only universities in the North-East that have their funding exceed their operating expenses. The table shows that there exists a serious gap in the funding of Nigerian universities. The burden of this funding gap many times is placed upon students who many times are demanded to pay higher fees to make up for the shortfall in the funding. Universities in the North-Central geopolitical zone have the highest operating expenses while the universities in the North-East have the lowest.

The federal universities have the highest operating expenses in the year 2017 with an average of about ten billion naira (N10b) while the mission based private universities have the lowest operating expenses. Table 3 also shows that on the average, the subvention received by the federal universities is lesser than their operating expenses. While the average operating expenses for federal universities stood at about ten billion naira (N10b), the subvention for these universities is about nine billion naira (N9b) on the average.

Internally Generated Revenue

The distribution of the internally generated revenue across Nigeria universities is shown in the tables 2 and 3. While it is observed that across all the regions and ownership categories, the operating expenses of Nigeria universities are higher than the subvention/grants from their owners. It therefore remains that those institutions must focus on their internally generated revenue to be able to meet up with their expenses.

For federal and state universities, their major advantage lies in the high students' enrollments through which can generate fund only that there are usually limits. The federal and state universities also have the advantage of funding from TETFund, endowment funds etc to greatly boost their funds.

The case is however different for private universities. They are profit oriented and so tuition fees constitute the bulwark of their financial strength as the size of their income is totally

dependent upon the number of students enrolled and profits are usually maximized by a larger enrolment (Ahunaya and Osakwe, 2012). Looking at table 2, while gaps in the students enrollments between government owned and private universities a terribly wide, there is not too much difference in their internally generated revenue. This could only have happened through the high tuition fees regimes across these private universities.

3. 2.1 Efficiency Analysis of Nigeria Universities

Table 4 below shows the efficiency of selected Nigerian Universities. As stated in the methodology, the efficiency was measured using the CCR model of the DEA. The result shows that of the 121 universities utilized for this study, only 19 universities attained the efficiency score of 1. The remaining 102 universities were not efficient for the 2017 academic session. Of this 19 efficient universities, 5 of them are state universities, only 1 belong to the categories of universities that are mission based, 1 of the efficient universities belong to private universities with no link to missions while the rest 12 are federal universities. The implication is that the managements of these universities were successful in converting input to output and they also utilized a better scale of operation for the period of the study. Inua and Maduabum (2012) in their study of efficiency of federal universities in Nigeria found only 4 of the 17 selected universities efficient which represents about 23%. The results of this study however show a better performance than those obtained by 12 of the 40 selected federal universities in this study which represent about 30% were found to be efficient.

Table 4: Efficiencies of Individual Selected Universities

Decision Making Unit (DMU)	Efficiency Score
Ambrosse Ali University, Ekpoma	1
Babcock University, Ilishan Remo	1
Bayero University, Kano	1
Bells University of Tech, Ota	1
Cross - River University of Technology	1
Enugu State University of Science and Technology	1
Federal University of Technology, Minna	1
Federal university of Tech. Akure	1
Kebbi State University	1
Kogi State University	1
Lead City University	1
Modibbo Adama Univ. of Tech, Yola	1
National Open University	1
University of Ilorin	1
University of Jos	1
University of Port-Harcourt	1
University of Nigeria, Nnsukka	1
University of Ibadan	1
Federal university gusau	1
Lagos State University, Ojo	0.97876
Federal University of Oye, Oye Ekiti	0.86072
Federal University of Agric. Abeokuta	0.77990

Kaduna State University	0.71744
University of Agriculture Makurdi	0.69087
University of Abuja	0.64570
Federal University, Dutse	0.59927
IBB University, Lapai	0.51447
Tai Solarin College of Education, Ijebu Ode	0.49512
Umar Musa Yaradua University, Kastina,	0.44058
Nasarawa State University, Keffi	0.41967
Akwa-Ibom State University. Uyo	0.40959
Niger Delta university, Yenegoa	0.40882
Alex Ekweme University, Ndufu Alikwe Nkwo	0.37704
Madonna University, Elele	0.35701
Coal City University, Enugu	0.34211
Renaissance university, Enugu	0.34210
Nigeria Defnce Academy, Kaduna	0.33876
Crescent University, Abeokuta	0.32429
Ahmadu Bello university, Zaria	0.30679
University of Uyo, Uyo	0.29962
Ebonyi State university, Abakaliki	0.27472
Ajayi Crowther university, oyo	0.25501
Federal University, Geshua	0.24310
Yobe Stat Univrsity, Damaturu	0.24040
Redeemers university, Mowe	0.22878
Elizade University, Ilaramokin	0.21784
Imo State University	0.21750
Fedral University, Kashere	0.19504
Pan - Atlantic university, Lagos	0.19280
Bingham University, New Karu	0.17923
Oduduwa University, Ipetu	0.16461
University of Benin	0.16384
Covenant Unicersity, Ota	0.16304
Landmark University	0.16207
Igbinedion Universitym Okada	0.16033
Fedral University of Petroleum Resources, Effurun	0.15881
Sokoto State University, Sokoto	0.15536
University of Lagos	0.15463
Plateau State university, Bokkos	0.15415
Afe babalola University	0.14425
Sule Lamido University,	0.14386
Micheal Okpara Univrsity of Agriculture	0.14345
Evangel University, Akaeze	0.14307
Delta State University, Abraka	0.14001
Ondo State University of Scienc and Tech, Okitipupa	0.13837
University of maiduguri	0.12501
Gombe State University, Gombe	0.12465
Ekiti Stat Univrsity, Ado Ekiti	0.12101
Edwin Clarke Univrsity, Kaigbodo	0.11773
Edo State Univrsity	0.11253
Ladoke Akintola University of Tech	0.11065
Verita University, Abuja	0.10726

Federal University, Lokoja	0.10362
Benson Idahosa University, Benin City	0.10340
Nnamdi Azikwe University, Okwa	0.10177
Nigeria Police Academy, Wudil	0.10176
Federal University, Lafia	0.10098
American Univrsity of Nigeria, Yola	0.09613
Joseph Ayo Babalola Univ., Ikeji Arakeji	0.09603
Benue State University, Markurdi	0.09113
Federal University of Tech, Owerri	0.08301
University Calabar, Calabar	0.08219
Usman Danfodio University, Sokoto	0.08058
Fountain University, Osogbo	0.07273
Adeleke University Ede	0.07104
Bowen University, Iwo	0.06842
Nile University of Nigeria, Abuja	0.06632
Obafemi Awolowo University, Ile-ife	0.06600
Adamawa State University, Mubi	0.06473
Abia State University, Uturu	0.06022
Yusuf Maitama university, kano	0.06010
Ondo State Univrsity of Medicals, Ondo	0.05990
Abukakar Tafawa Balewa university	0.05883
Ignatus Ajuru University of Education, Rumuolumeni	0.04918
Macpherson University, Ajebo	0.04350
Carita University, Enugu	0.03864
Al-Qalam Univrsity, Kastina	0.03625
Federal University, Dutsin Ma	0.03342
Baze University Abuja	0.02856
Godfery Okoye University, Ugwuomunike	0.02637
Clifford university, Owerinta	0.02457
Crawford university	0.02285
Achivers University Owo	0.01789
Al-Hikma Univrsity, Ilorin	0.01750
Taraba State University, Jalingo	0.01447
Hezekiaiah University, Umudi	0.01327
Gregory University, Uturu	0.01180
Samuel Adegboyega University, Ogwa	0.01076
African University of Science and Tech, Abuja	0.01037
Technical University, Ibadan	0.01029
Chrisland University, Owode Abeokuta	0.00779
Wesley University, Ondo	0.0074
Salem University, Lokoja	0.00610
Kings University, Ode Omu	0.00597
Anchor university, Ayobo	0.00533
Mountain Top University, Lagos	0.00518
Arthus Javus University, Akpoyibo	0.00413
Dominican University, Ibadan	0.00314
Augustine University, Ilara Epe	0.00260
Hallmark University, Ijebu itele	0.00203
Christopher University, Mowe	0.00136

Source: Authors' calculation, 2019

3.2.2 Efficiency Distributions According To Class of Universities

Table 5 shows the efficiency of Nigerian universities according to their classes. By class we mean federal university, state universities, mission-based private universities and private universities that are not mission-based. The result reveals that federal universities are still the best performing universities in the country. The universities in this category have mean efficiency value of 0.478. This is followed by state universities with efficiency mean score of 0.358. Private universities are the worst performing universities according to the parameters employed in this study. Of note are the mission based universities with the mean efficiency score of 0.159.

Table 5: Efficiency Distributions According To Class of Universities

	class	mean	sd	min	max	n
1	F	0.477817	0.382631	0.03342	1	39
2	FP	0.128698	0.211193	0.00314	1	23
3	P	0.159244	0.256018	0.00136	1	29
4	S	0.358093	0.360464	0.01029	1	30

Source: Authors' calculation, 2019

3.2.3 Efficiency Distributions According To Geopolitical Zones

When the efficiency of Nigeria universities were examined along the line of the geopolitical zones, the result show that universities in the North – Central part of Nigeria are the best performing universities. Available data show that the universities in this region are the best in terms of funding. They also have one the highest staff to student ratio when compared with other geopolitical zones. Universities in the South-West zone have one of the low average efficiency values. Universities in the North-West and South- South zones of Nigeria have better efficiency output when compared with those from the South-West

Table 6: Efficiency Distributions According To Geopolitical Zones

	zone	mean	sd	min	max	n
1	FCT	0.291063	0.381413	0.01037	1	7
2	NC	0.43664	0.42085	0.0061	1	15
3	NE	0.263482	0.286008	0.06473	1	9
4	NW	0.379563	0.369047	0.03342	1	15
5	SE	0.239776	0.313483	0.00413	1	24
6	SS	0.365724	0.338924	0.04918	1	11
7	SW	0.269788	0.356409	0.00136	1	40

Source: Authors' calculation, 2019

3.2.4 Efficiency Distributions of Universities According to Classes within the Zones

Table 7 below shows the efficiency distribution of Nigerian universities according to the classes within the different geopolitical zones in Nigeria. The table shows that in the FCT, the Federal universities have the best efficiency performance while the private universities have the lowest mean efficiency. In all the other geopolitical zones too, the Federal universities have the highest mean efficiency except for the South-East geopolitical zone where the state universities have the highest mean efficiency of 0.444. The efficiency of mission-based private universities are generally lowest in all the geopolitical zones.

Table 7: Efficiency Distributions of Universities According to Classes Within the Zones

	zone	Class	mean	sd	min	max	n
1	FCT	F	0.823	0.251	0.646	1	2
2	FCT	FP	0.179	0.284	0.179	0.179	1
3	FCT	P	0.053	0.043	0.01	0.107	4
4	NC	F	0.649	0.44	0.101	1	6
5	NC	FP	0.062	0.008	0.006	0.162	3
6	NC	S	0.366	0.366	0.014	1	6
7	NE	F	0.369	0.358	0.125	1	5
8	NE	P	0.096	0.377	0.096	0.096	1
9	NE	S	0.143	0.089	0.065	0.24	3
10	NW	F	0.396	0.367	0.033	1	10
11	NW	S	0.415	0.419	0.06	1	5
12	SE	F	0.312	0.353	0.083	1	6
13	SE	FP	0.086	0.068	0.011	0.143	3
14	SE	P	0.107	0.141	0.004	0.342	9
15	SE	S	0.444	0.437	0.06	1	6
16	SS	F	0.385	0.42	0.082	1	4
17	SS	P	0.175	0.162	0.049	0.357	3
18	SS	S	0.49	0.363	0.14	1	4
19	SW	F	0.622	0.39	0.066	1	7
20	SW	FP	0.154	0.247	0.003	1	15
21	SW	P	0.235	0.366	0.001	1	12
22	SW	S	0.236	0.367	0.01	0.979	6

Source: Authors' calculation: 2019

4.0 Conclusion and Policy Recommendations

The results of this study show that Nigerian universities are still largely inefficient. Of the 121 universities examined, only 19 of them are operating at the efficiency level which implies that they have successfully and strategically managed and utilized all the resources available to them. No input was left idle or underutilized.

However, one is not unaware of the limitations of our research study. The selection of inputs and outputs to control performance at the universities is very difficult (McCormick and Meiners, 1988). At the same time, we used have used in this study the available data when compared with other notable works that have been carried out in this regard. In the future, it will be our greatest desire to exploit other inputs combination especially the research based efficiency to see if better results could be obtained for Nigerian universities.

Strategies that increases fund to Nigerian universities without compromising the qualities nor imposing extra burden on the students must be embraced by the stakeholders to reposition Nigeria universities for optimum performance and efficiency and also make them to become globally competitive.

Universities in Nigeria may also need to look inward for best management practices which can help them to block leakages and improve management and operational efficiencies in the system. This includes but not limited to automation of many of the operations and strict management and operational procedures. These will go a long way to cut down the operational expenses and make sufficient fund available for staff development and welfare which is a major tool of efficiency in a university system.

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