

## **U**SING BUILD-OPERATE-TRANSFER (BOT) APPROACH IN ENCOURAGING PRIVATE INVESTMENT IN NIGERIA UNIVERSITIES HOSTEL ACCOMMODATION DEVELOPMENT SCHEME

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### **ABSTRACT**

**N**igerian Universities are growing rapidly, leading to an increase in the demand for hostel accommodation. The development of these hostels has mostly remained the exclusive responsibility of the owners. Due to increasing demand, shortage of public funds and other factors the government is now seeking to share this responsibility with private investors. What is being proposed as a remedy is a privately financed infrastructure scheme in the form of the Build- Operate- Transfer (BOT) approach. The University Hostel Development Scheme (UHDS) is already adjudged a total failure and almost an abandoned scheme. There are numerous reasons why government policies usually fail; there could be political, social, legal or economic reason any of which could derail or halt a good vision. However, for investors, one cardinal reason

### **Introduction:**

Despite its tremendous growth from a single university by her independence in 1960 to over 150 together with other degree awarding institutions by 2011, the demand for University education in Nigeria is only 15% satisfied (Suleiman, 2002). The university sector in Nigeria has not only grown in number, it has also recorded significant changes in ownership, funding and management styles. As of the year 2010 Nigeria had 25 federal universities and at the end of year 2011 the federal government created another 6 making it 31 federal universities, 34 states', about 40 private universities and

*for business failures is the economic viability of the investment. If the UHDS were economically viable, investors would flock to it with or without government facilitation. So this study looks at the economic viability of the UHDS (BOT option) in Nigeria and the need for private investors to participate in UHDS. The study measured the Net Present Value (NPV) to see if the scheme was economically viable or not, and Pay Back Period (PBP) of the scheme to see how long it will take the investors to recoup back their money using the conventional NPV and PBP formulae. The study concluded that while the scheme showed high net return on the investment (profit), the PBP were too long for the kind of investors (mostly short-term investors) the scheme had. The study therefore recommended measures such as changing the design of the hostels to reduce cost and consequently lower the PBP to a shorter and more acceptable period to the investors.*

**Keywords:** *University-Hostel; Development; Investment; Bot; Viability.*

Over 50 other degree awarded institutions, (JAMB, 2010/2011). To further encourage private participation in the provision of university education in the country the government in the year 2004 launched the UHDS through a partnership between the government and private investors. This is because students are suffering under the heavy yoke of inadequate, uncomfortable and indecent hostel accommodation and overstretched facilities, which adversely affect their educational and social performance and distract even the University Authorities. Thus, it is desirable to bequeath to the Nigerian Universities, a decent, comfortable and well managed hostel accommodation, which should imbibe good design and aesthetics with some fundamental requirements (FMHUD, 2004).

Seeley (1996) gave the requirements as follows:

- i. Away from main roads and resultant noise and vibration but readily accessible to distribution road and also bus routes where possible.
- ii. Sufficient area to accommodate buildings with ample space for probable future extensions.
- iii. Preferably of regular shape and well above highest ground water level.
- iv. Freedom from major obstructions.
- v. Adequate utility services.

vi. Compatible with adjoining uses.

FMHUD (2004) therefore, proffers that due to the high cost of land its usage should be maximized in which hostel design should be functional and carry aesthetics allowing for controlled access into the block. Rooms should be planned around courtyards and allowing for sharing between two or four. The purpose for this is to encourage students' interaction in a community sense and discourage individualism that leads to social vices. Dick (1973) also stated that the main aim of hostel designs are to make explicit the performance requirements of the user and to assist the designer with the process of finding solutions which are both performance and cost-effective.

The UHDS took off in 2006 with six universities selected in each of the nations' geopolitical zone to pilot the scheme. Among those selected were ABU, FUTMN and UNIMAID representing North-Western, North-Central and North-Eastern zones respectively. However, by 2011 when this study visited the three universities to assess the progress so far nothing significant was recorded. The scheme was found to have been abandoned. The scheme, it was found, at its initial take off faced serious problems that were left unaddressed. The problems, any of which could affect the success of the scheme, included:

- Political
- Social
- Economic
- Legal

This study is concerned with the economic viability of the scheme with the view to highlighting the problem areas and suggests feasible remedies.

#### WHAT IS BOT

Shalanky (1996) defined the BOT approach as the granting of concession by the government to a private promoter, known as the concessionaire who is responsible for financing, construction, operation and maintenance of a facility which is later transferred to the government at no cost. The concession period allows the private entity to generate revenue so as to recover its investment and make profit. Tiong (1995) posited that the concession period depends on the terms of agreement reached between the parties involved. Thus it can be defined as a model that entails a concession company providing the financing,

design, construction, operation and maintenance of a privatized infrastructure project for a fixed period at the end of which the project is transferred free of charge to the host government (Nassar, 1996).

The reasons for private sector participation for these projects according to Shalanky (1996) are as follows.

- i. Need of the government to get these projects
- ii. Unwillingness of government to exclusively finance infrastructure projects.
- iii. Availability of offering finances from lending institutions and investors.

This BOT infrastructure delivery is gaining widespread popularity especially in developing countries (Chee and Yeo, 1995).

### Methodology

#### *Data collection:*

The study measured the Net Present Value (NPV) to see if the scheme was economically viable or not, and Pay Back Period (PBP) of the scheme to see how long it will take the investors to recoup back their money using the conventional NPV and PBP formulae. Data require for computing the cash flow profile of the scheme was collected from two sources: Demand-side profile that provided income of the scheme was sourced from a sample survey of 150 students in the three universities, ABU, FUTMN and UNIMAID; 138 questionnaires were returned. The supply-side profile providing the expenditure profile was calculated using a set of two hostel designs for female and male students designed by ABUCONS consultants for ABU.

#### *Data analysis:*

- i. Descriptive statistical tools were used to estimate the mean, percentages and ratios.
- ii. Using life – cycle costing technique the whole life cost of the hostels designs were computed.
- iii. Project income and expenditure for the concession period of 25 years were computed.
- iv. Applicable formulae were used to compute the PBP and NPV of the developments.

## RESULTS AND DISCUSSION

The analysis of the 138 respondents in figure 1: showed that 62% of them are undergraduates (UG), 31% are postgraduates (PG), while 7% are others from non degree courses. It can be deduced that the responses received gave a fair representation of all categories of students on campus.

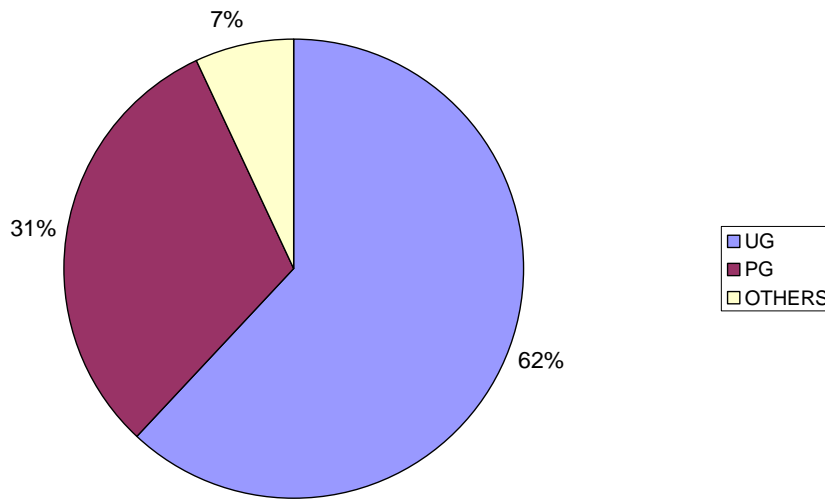


Fig. 1: Pie-chart showing category of respondents

Table 1 provides the percentages of students living on campus and those living off campus. 51% of the respondents live on campus and 49% live off campus. The proportion of respondents living on or off campus is almost equal, meaning half of the students are living off campus.

Table 1: Proportion of respondents living on/off campus, and like Accommodation on/off campus.

Living(on/off)	No	%
On Campus	71	51
Off Campus	67	49
Like Hostel	No	%
On campus	45	67.2
Off campus	22	32.8

Information obtained on those wanting to live on campus showed 67.2% indicating interest to live on campus and 32.8% indicated that they will like to live off campus.

**Table 2: Satisfaction with the present hostel accommodation design and will pay higher for better design.**

Level	No	%
Satisfied	45	33
Not satisfied	93	67
Level	No	%
Willing	85	62
Not willing	53	38

Table 2 presents 67% of the respondents not satisfied with the present hostel accommodation design they live in and 33% indicated that they are satisfied. It is quite simple to deduce from this result that students live off campus these days partly due to this reason of unsatisfactory hostel accommodation. Interestingly, 62% said they are willing to pay higher rent if better designs could be provided.

**Table 3: Proportion supporting the policy of/reason for private agencies providing hostel accommodation**

Support	89	64
Not support	49	36

Description	No	%
Proficient facility delivery	23	17
Proficiency in Facility Management	30	22
Provision of utilities	13	9
Provision of quality accommodation	72	52

Table 3 presents the proportion of the respondents who support or not support the government decision to involve private investors in the UHDS; 64% of the respondents consider the involvement of private investors a good idea, which will be welcome in the pursuit of quality education in the tertiary institutions in Nigeria. 36% do not consider it a welcome idea. The table also presents the results of the reason for preferring private investors to public in providing hostel accommodation; 52% indicated their reason for preferring private investors to public was because of provision of quality accommodation and proficiency in facilities management, which the private investors give priority to.

**Table 4: Preference of Facilities to be provided in the Hostel Design**

Facilities	No.	Mean	Std. Deviation	Std. Error	Ranking
Bedroom	138	1.90	.595	.051	5 <sup>th</sup>

Living Room	138	2.74	.441	.038	1 <sup>st</sup>
Kitchen	138	1.72	.551	.047	7 <sup>th</sup>
Dining room	138	1.02	.146	.012	11 <sup>th</sup>
Toilet	138	2.25	.465	.040	2 <sup>nd</sup>
Bathroom	138	2.08	.568	.048	3 <sup>rd</sup>
Shower room	138	1.47	.707	.060	9 <sup>th</sup>
Store	138	1.13	.338	.029	10 <sup>th</sup>
Games room	138	1.48	.642	.55	8 <sup>th</sup>
Study room	138	2.08	.695	.059	3 <sup>rd</sup>
Laundry	138	1.84	.697	.059	6 <sup>th</sup>

Features	No.	Mean	Std. Deviation	Std. Error	RANKING
Privacy	138	2.44	.705	.060	3 <sup>rd</sup>
Access	138	2.27	.700	.060	5 <sup>th</sup>
Proximity	138	2.27	.760	.065	5 <sup>th</sup>
Freedom	138	2.46	.641	.055	2 <sup>nd</sup>
Security	138	2.70	.459	.039	1 <sup>st</sup>
Quality accommodation	138	1.96	.671	.057	10 <sup>th</sup>
Availability	138	2.09	.714	.061	8 <sup>th</sup>
Rent per Room	138	2.17	.868	.074	7 <sup>th</sup>
Hygienic Env. Available	138	2.34	.560	0.48	4 <sup>th</sup>
Recreation Facilities	138	1.48	.642	.055	11 <sup>th</sup>
Maintenance of Facilities	138	2.08	.568	.048	9 <sup>th</sup>

The preferred design according to ranking should be one, which will give them security, freedom and privacy, which is found within the confine of the university hostel on campus with some facilities to make their accommodation self-contained (see table 4). These facilities: living room, toilet, bathroom and study room ranked 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> respectively.

This means the fear of not getting market is allayed. The investors would not have any reason to doubt the weather because the sky is clear as to the demand of quality accommodation on Nigeria Universities' campuses.

### Demand and Supply of accommodation

The table 5 presents a projected demand and supply for hostels in A.B.U. Zaria from 2011 to 2032. Because the future is difficult to predict some assumptions were made to assist in the forecast. It was assumed that from 2011 to 2020 demand would drop by 2% annually. Then finally, a growth of also 5% will be witnessed annually for the remaining years. This goes to show that students'

population fluctuates but will always exceed the current supply of hostel accommodation, which was kept constant in this projection.

**Table 5: Projected Demand and Supply Profile Over 25 Years for Hostel Accommodation in A.B.U. Zaria (cont'd).**

Year	Demand	Supply	Excess Demand	% Accommodated	% Not Accommodated
2011	33662	13454	20208	60.0	40.0
2012	33007	13454	19553	59.2	40.8
2013	32360	13454	18906	58.4	41.6
2014	31725	13454	18271	57.6	42.4
2015	31103	13454	17649	56.7	43.7
2016	30493	13454	17039	55.9	44.1
2017	29895	13454	16441	54.9	45.1
2018	28471	13454	15017	52.7	47.3
2019	27913	13454	14459	51.8	48.2
2020	27366	13454	13912	50.8	49.2
2021	28734	13454	15280	53.2	46.8
2022	30171	13454	16717	55.4	44.6
2023	31680	13454	18226	57.6	42.4
2024	33264	13454	19810	59.6	40.4
2025	34927	13454	21473	61.5	38.5
2026	36673	13454	23219	63.3	36.7
2027	38507	13454	25053	65.1	34.9
2028	40432	13454	26978	66.7	33.3
2029	42454	13454	29000	68.3	31.7
2030	44577	13454	31123	68.8	30.2
2031	46806	13454	33352	71.3	28.7
2032	49146	13454	35692	72.6	27.4

*Source: ABU Students Affairs Division*

#### Income study

2 bed spaces/room @ N30,000/bed space = N60,000/room

100 rooms in a block = 100X60,000 = N6,000,000.00

Let able areas = 36m<sup>2</sup>

Estimated rental value per annum = N5,000/m<sup>2</sup>

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Total = 363 x N5,000 = N1,815,000.00

Total income = N6,000,000.00 + N1,815,000.00 = N7,815,000.00

### Expenditure

Running cost (5% of income) = N390,750.00

Repairs and maintenance (0.5% of bldg cost) = N680,789.56

Cleaning cost (0.3% of bldg cost) = N408,473.74

Contingency (0.2% of bldg cost) = N272,315.83

= N1,752,329.13

### Development cost

Building (bldg) cost (from BOQ) = N136,157,911.31

Consultancy fees (10% of bldg cost) = N13,615 791.13

Management fees (8% of bldg cost) = N10,892,632.90

Interest on loan = N6,426 653.41

Development cost = N167,092,988.75

Total floor area = N4,407m<sup>2</sup>

Cost/m<sup>2</sup> = N37,915/m<sup>2</sup>

### Income and expenditure accounts

Capital amount for financing option

Development cost	Equity loan	Equity	Loan
N167,092,988:75	0:100	0	N167,092,988:75

Income and expenditure project for 25 years assuming 20% inflation every 5 years

Table 4.15: An Income and Expenditure for Male Hostel.

Year	1	2	3	4	5
Income	7.82	7.82	7.82	7.82	7.82
Expenditure	1.75	1.75	1.75	1.75	1.75
Profit	6.07	6.07	6.07	6.07	6.07
Year	6	7	8	9	10
Income	17.20	17.20	17.20	17.20	17.20
Expenditure	3.85	3.85	3.85	3.85	3.85
Profit	13.35	13.35	13.35	13.35	13.35
Year	11	12	13	14	15
Income	37.84	37.84	37.84	37.84	37.84
Expenditure	8.47	8.47	8.47	8.47	8.47

Profit	29.37	29.37	29.37	29.37	29.37
Year	16	17	18	19	20
Income	83.25	83.25	83.25	83.25	83.25
Expenditure	18.63	18.63	18.63	18.63	18.63
Profit	64.62	64.62	64.62	64.62	64.62
Year	21	22	23	24	25
Income	183.15	183.15	183.15	183.15	183.15
Expenditure	40.99	40.99	40.99	40.99	40.99
Profit	142.16	142.16	142.16	142.16	142.16

### Summary of findings.

From the Income study carried out the following findings were made:

- i. The projected income and expenditure accounts over the concession period of 25 years showed that there would be profit over the expected period.
- ii. The cash flow profile and the analysis of returns over the concession period of 25 years provided a good financial analysis, which showed the Pay Back Period (PBP) to be 16 years 4months.

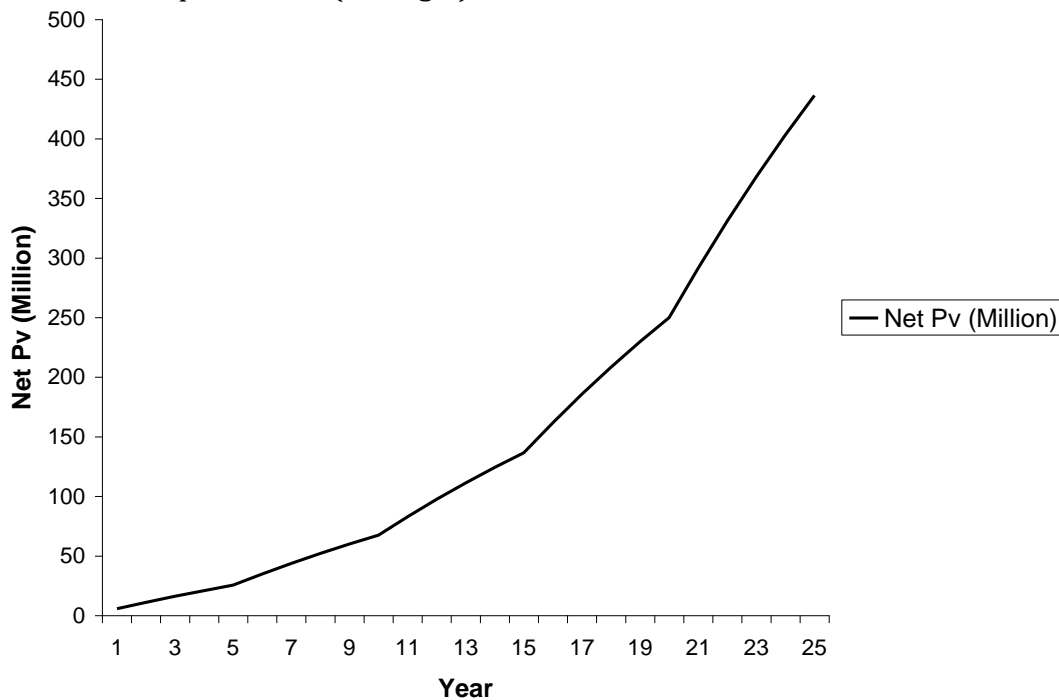
It was necessary to use the payback period for the study of this nature, because it was just the concession period that was giving and it gives a clear and definite period, but the investors will be interested in knowing when he is likely going to recoup his money and make profit. The investors' interest is hinged on time value of money because of this PBP becomes paramount

It is very difficult for private investors to tie down their money for so long a period 16 years before they can start receiving profit. Even though students have the interest to pay more, as much as N60,000.00 per room of self-contained, the private investors may not be interested in the project considering the long period it will take them to recover their money.

Meanwhile, in countries where BOT is practiced the impetus is not on PBP but on market size, stable government policies and continuity. Our investors need to know that BOT is a long term investment as proven elsewhere in the world. Therefore, the factors to consider by Nigeria's investors are:

- i. Most universities are only accommodating half of their students' population on campus.
- ii. Students are very willing to stay on campus (See table 1).
- iii. A total of 67% of the students are not satisfied with their present hostels' design.

- iv. Most of the students who indicated their willingness to stay on campus 63% of them are willing to pay more (higher rent) should the hostel designs meet their needs. (See table 2).
- v. Students' preferences or needs were not made in the proposed designs already submitted to the universities.
- vi. The Net Present Value (NPV) of the net cash flow for both male and female hostels showed positive indicating that the proposed project is profitable. (See fig 2)



**Fig 2: Hostel cash flow showing an upward NPV**

Fig 2 present a gradual upward movement until after year 16 that the cash flow was able to upset the total investment, which is the payback period (PBP). It is noted that after year 16 a steep curve was obtained showing the profit level is high after PBP.

## CONCLUSION

The idea by the federal government to tackle the ever increasing demand for hostel accommodation as a result of students' population in Nigerian tertiary institutions through private investors under the BOT scheme is a child of necessity. However, be it viable as it seems, the private investors will not be willing to go into such a capital tied down project, which will only start yielding profit for them in about 16 years time. Therefore, stemming from the fact that

majority of students can afford and are willing to pay more for accommodation that meets their needs is an indicator to the economic viability of the scheme. What seems to scare private investors away is the long time it will take them to recover their money.

The study therefore recommends that designs should be made to meet the students' preferences/ needs and designs should be reviewed to reduce unwanted free space areas to reduce high cost of development. This will pave way for more revenue to be generated and the issue of no interested tenants will be knocked out. The impetus by the investors should be on long term investment and not the PBP.

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