

# Benchmarking the Performance of Construction Procurement Methods against Selection Criteria in Nigeria

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**Abstract:** The study developed performance indices by the widely used procurement options in Nigeria on selection criteria. The traditional mean and standardized ratio were used to form the utility coefficients. Results revealed that performance by the procurement options depended on the respondents' categorization and cost categorization of projects. Public clients ranked the lump sum contracts more able to achieve speed for projects up to N100 million (Naira) while the private clients believe it is the design-build. As regards quality, public clients rated the Build-Own-Operate-Transfer (BOOT) system as most able to achieve the quality criterion whereas private clients rated design-build for projects up to N100 million (Naira). The study then concluded that, in the Nigerian construction industry participants do not agree on the performance of the procurement options on selection criteria.

**Keywords:** Benchmarking, performance procurement methods, selection criteria, Nigeria.

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## Introduction

Construction projects evolve through the stages of conception, design and construction. A potential owner initiates the conception process by making clear his needs and requirements in a form of a brief to a professional. At the design stage, the relevant professionals translate the primary concept into an expression of a spatial form to satisfy the owner's requirements in an optimum and economic manner [1]. At the construction phase, the conception and design are actualized in a practical terms to satisfy the brief. The various combinations of the design and construction phases to achieve forms of organization to implement the project is regarded as the procurement method.

In Nigeria the method of organizing and managing project processes are essentially by the traditional method of design-bid-construct [2]. This method has however, been widely criticized for its separation of the design phase from the construction phase. It is believed that it is not effective for all categories of building projects (3).

According to Higgins and Jessop [4] this has led to lack of effective communication and coordination and therefore creating uncertainty. Various shortcomings

led to Emerson's [5] report and Banwell's [6] report in Britain. Since then, there has been a proliferation of procurement options to organize and manage both the design and construction phases. As observed by Mohsini and Botros [7], these alternative procurement options evolved because the traditional contracting method had become inadequate in meeting the organizational challenges in the construction industry. However, the alternatives seem to address only few shortcomings of the traditional contracting method. Hence any of these alternatives is most effective under certain specific conditions. This being the case, there is need to evaluate the performance of the procurement methods on the factors that influence their choices with particular reference to the Nigerian settings. Particularly since none of the studies on procurement methods in Nigeria has ever determined their performance empirically against selection criteria.

## Procurement Methods in Use

In Nigeria, the following procurement methods are used to implement construction projects: design-bid-construct; design-build system, management contracting, direct labour system and Build-Own-Operate-Transfer (BOOT).

The design-bid-construct (the traditional contracting system) is essentially sequential approach in which the client allows the professionals to play their full part in the correct sequence [8]. The major benefit lies in the checks and balances created by separating the architect and contractor's responsibilities. In this study, the lump sum contract, a variant of design-bid-construct was evaluated against selection criteria. It is the most commonly used procurement method in Nigeria [2]

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The design-build system is an integrated procurement approach in which a contracting organization takes responsibility for all aspects of the project [9]. It has been described by Ireland [10] as a single financial transaction under which one person or organization designs and builds a building to the firm order of another person or organization, the customer. It is claimed by Ajanlekoko [11], that by using this method of building procurement, the client meets his demand for a single point of contract, securing his building for a pre-agreed price and possibly in a time scale not otherwise achievable without considerably risk.

Management contracting is a system by which a contractor is appointed at the pre-construction stage to manage and deliver the project [12]. He is expected to offer buildability advice at the design phase and uses on-site knowledge to avoid the design of elements that will be problematic to produce [13]. The main benefit to the client is the possibility of integrating design and construction phases.

In the direct labour system, the client engages tradesmen directly to execute projects by either using in-house personnel to design and construct or directly employ operatives to construct [14]. By this method, the services of a contractor are dispensed with and this elimination makes the direct labour system distinct from other procurement methods. It is believed that the system is simpler, cost-effective (the contractor's profit is eliminated) prudent, corruption free and provides jobs for the populace.

In the construction industry, there is an emergence of public private sector initiative as a result of the need and demand for new infrastructures, rehabilitation and maintenance of existing facilities. This collaboration has led to what is called BOOT procurement method. Though used widely to procure civil engineering projects, it is being used also to provide housing stocks and viable commercial projects, such as the provision of mega market projects.

### Data Collection Procedure

The study population comprised three major groups namely; clients, consultants and contractors. The client group was divided into two sub-groups of public and private clients. The consultants group comprised the Architects, Quantity Surveyors, Engineers and Builders. Contractor targeted were medium and large sized construction contractors listed in the register of the Federation of Construction Industry (FOCI). A pilot survey carried out revealed that these groups are deeply involved in

the construction process and they regularly use and are experienced in the various procurement methods.

Out of the 50 questionnaires administered to the clients using purposive sampling method, 39 (26 public and 13 private) questionnaires (78% response rate) were correctly filled and received. As for the 132 questionnaires distributed among the consultants using purposive sampling, 50 (38% response rate) were received but after a thorough check, 27(20%) were appropriate for analysis. As regards the contractors' questionnaire 65(the sample size) was distributed, 36(55% response rate) were received and after a thorough check, 27 (42% response rate) were appropriate for analysis.

Table 1 provides details of questionnaires distributed and the number of correctly completed questionnaires among the three classes of respondents.

**Table 1.** Distribution and number of completed questionnaires

<b>Class of Respondents</b>	<b>No distributed</b>	<b>Response level</b>	<b>Percentage of response %</b>
Clients	50	39	78
Consultants	132	27	20
Contractors	65	27	42
<b>Total</b>	<b>247</b>	<b>93</b>	<b>38</b>

Source: Field survey, 2006

### Procurement Method's Performance Analysis

According to Rush [15], performance is the measurement of achievement against intention. However, in the context of this study, performance was represented in terms of suitability of a procurement option achieving a selection criterion. The selection criteria are those discussed in earlier paper [16] such as speed, cost certainty, time certainty, price competition, quality, risk avoidance in terms of time slippage, and risk avoidance in terms of cost slippage. These are what Chang and Ive [17] say are the right variables. The three classes of respondents (clients, consultants and contractors) were asked to rate the suitability of each procurement option in achieving a selection criterion for a cost category using a Likert scale of 1 to 10. The cost categories are N10 million (Naira) - N100 million (Naira), N101 million (Naira) – N500 million (Naira) and above N500 million (Naira). Meanwhile N120 (Naira) is equivalent to \$1 (dollar). A rating of 1 means low suitability and 10 means very high suitability in achieving a selection criterion. These utility coefficients relate procurement methods with selection criterion. Two major methods of analysis were used to analyse the data generated from the respondents' rating.

- 1- The Traditional Arithmetic Mean
- 2- Mean Performance Indices

**The Traditional Arithmetic Mean**

The mean performance of the procurement methods on each criterion was evaluated using this mathematical expression:

$$\text{Mean Performance (Np)} = \sum_{i=1}^N P_i \quad (1)$$

Where Np is the mean performance on a criterion, i = 1,2,3... N and N is the number of respondents. The mean performance is termed “utility factor” i.e. the extent to which a procurement option satisfies a criterion. The summary of mean performance on a criterion by procurement options are presented in Table 2, for public clients, Table 3 for private clients, Table 4 for consultants, Table 5 for contractors.

The results of mean performance of procurement methods by public clients showed that for a building project up to N100 million (Naira), lump sum contracts is more able to achieve speed i.e. early completion of project than all other procurement options. This result seems to be contrary to the widely believed notion that the lump sum contract is slower as a result of separation of construction from design. The design-build which allows overlap of the design and construction processes leading to early completion of project was ranked third. Public clients perception of the ability of BOOT system in achieving speed is contrary to the findings of an earlier work by Adeogbo and Kolawole [18]. It can be observed in Table 2, that, lump sum contracts was rated more suitable to achieve speed than all other procurement options for all cost categories while the BOOT system was rated the least able to achieve speed for all cost categories.

**Table 2.** Mean performance of procurement methods on selection criteria by public clients

Selection criteria	Lump Sum Contract			Design-Build			Management Contracting			Direct Labour			BOOT		
	10m – 101m – Above 100m			10m – 101m – Above 500m			10m – 101m – Above 500m			10m – 101m – Above 100m			10m – 101m – Above 500m		
	100m	500m	500m	100m	500m	500m	100m	500m	500m	100m	500m	500m	100m	500m	500m
1. Speed	9.1	9.1	9.2	8.0	7.6	8.8	7.7	7.8	8.0	8.6	8.1	8.5	6.7	6.7	6.7
2. Cost Certainty	8.2	7.9	8.8	8.5	8.4	8.6	8.0	8.7	8.7	7.9	7.8	7.7	5.7	5.7	5.3
3. Time Certainty	7.9	7.6	8.2	7.7	8.0	8.2	8.8	8.5	8.8	9.3	8.6	9.2	9.0	9.0	9.0
4. Price competition	8.0	8.0	8.2	7.7	7.8	8.0	7.4	8.3	8.5	5.8	6.1	5.8	4.7	4.7	4.7
5. Quality	8.6	8.4	9.0	8.7	8.8	9.0	8.9	9.2	9.5	9.1	8.4	8.8	9.3	9.3	9.3
6. Risk Avoidance (time)	8.1	8.4	7.7	8.0	8.2	8.4	8.0	8.8	8.8	8.3	7.7	7.7	8.7	8.7	8.7
7. Risk Avoidance (cost)	8.0	8.3	8.7	7.3	7.6	7.8	8.2	8.5	8.8	7.9	6.9	7.5	7.7	7.7	8.0

Source: Field survey (2006)

**Table 3.** Mean performance of procurement methods on selection criteria by private clients

Selection criteria	Lump Sum Contract			Design-Build			Management Contracting			Direct Labour			BOOT		
	10m – 101m – Above 100m			10m – 101m – Above 500m			10m – 101m – Above 500m			10m – 101m – Above 100m			10m – 101m – Above 500m		
	100m	500m	500m	100m	500m	500m	100m	500m	500m	100m	500m	500m	100m	500m	500m
1. Speed	8.1	7.7	7.9	8.9	9.1	9.1	8.5	8.4	8.8	8.3	8.7	9.5	8.0	9.0	9.0
2. Cost Certainty	8.6	8.7	9.1	8.7	9.0	9.5	8.7	8.4	9.0	8.3	8.4	9.8	8.3	8.3	9.0
3. Time Certainty	8.2	7.8	7.7	8.2	8.7	9.0	8.7	8.7	8.3	8.0	7.6	8.5	8.7	9.3	8.5
4. Price competition	7.9	8.1	8.2	8.2	8.5	8.8	8.4	8.3	8.6	7.9	7.6	8.5	7.6	8.0	7.5
5. Quality	9.0	8.8	9.0	9.3	8.9	9.1	8.6	8.7	9.2	8.5	8.6	9.0	7.3	7.7	9.5
6. Risk Avoidance (time)	7.6	7.3	7.9	8.2	7.4	8.8	7.8	7.9	8.5	8.4	7.0	8.0	7.0	6.7	7.5
7. Risk Avoidance (cost)	7.6	7.5	8.0	7.5	7.2	8.0	7.8	8.0	8.6	7.7	7.6	9.0	7.8	7.0	8.0

Source: Field survey (2006)

**Table 4.** Mean performance of procurement methods on selection criteria by consultants

Selection criteria	Lump Sum Contract			Design-Build			Management Contracting			Direct Labour			BOOT		
	10m – 101m – Above 100m			10m – 101m – Above 500m			10m – 101m – Above 500m			10m – 101m – Above 100m			10m – 101m – Above 500m		
	100m	500m	500m	100m	500m	500m	100m	500m	500m	100m	500m	500m	100m	500m	500m
1. Speed	7.9	7.8	7.9	8.2	7.5	7.2	7.4	7.2	7.1	7.4	6.6	6.3	7.0	6.7	7.7
2. Cost Certainty	8.2	8.1	8.3	7.8	7.2	6.9	8.1	8.1	8.2	7.2	7.2	7.2	6.7	6.9	6.9
3. Time Certainty	8.3	8.1	8.1	7.9	7.8	8.1	8.3	8.1	8.0	7.4	7.5	7.4	8.2	7.9	8.4
4. Price competition	7.8	8.1	8.1	7.4	7.2	6.6	7.9	7.4	7.2	6.6	6.6	7.1	5.9	5.1	4.4
5. Quality	8.0	8.1	8.3	8.3	8.1	8.2	8.0	7.7	7.5	6.4	7.2	7.7	6.5	6.3	6.6
6. Risk Avoidance (time)	6.3	6.2	6.5	6.5	6.0	6.2	7.4	7.0	6.8	7.2	7.1	7.5	6.6	6.4	6.6
7. Risk Avoidance (cost)	7.1	6.9	7.3	6.4	5.8	6.3	6.7	6.7	6.9	6.6	7.0	7.8	6.1	6.3	6.8

Source: Field Survey (2006)

**Table 5.** Mean performance of procurement methods on selection criteria by contractors

Selection criteria	Lump Sum Contract			Design-Build			Management Contracting			Direct Labour			BOOT		
	10m – 100m	10m – 500m	Above 500m	10m – 100m	10m – 500m	Above 500m	10m – 100m	10m – 500m	Above 500m	10m – 100m	10m – 500m	Above 500m	10m – 100m	10m – 500m	Above 500m
1. Speed	8.1	6.6	5.0	9.1	9.3	9.0	9.1	7.3	5.5	-	-	-	9.0	-	-
2. Cost Certainty	7.1	6.1	7.0	7.4	8.8	8.2	6.8	7.3	10.0	-	-	-	9.0	-	-
3. Time Certainty	8.3	7.9	7.8	8.1	8.6	8.6	8.2	9.0	10.0	-	-	-	9.0	-	-
4. Price competition	8.2	7.3	7.3	7.2	7.8	7.6	8.0	9.0	9.5	-	-	-	9.0	-	-
5. Quality	8.9	8.9	8.5	9.7	9.4	8.0	7.9	9.7	8.7	-	-	-	9.0	-	-
6. Risk Avoidance (time)	8.4	8.3	9.0	8.0	7.0	8.8	6.1	9.3	10.0	-	-	-	9.0	-	-
7. Risk Avoidance (cost)	8.3	8.1	8.0	8.2	8.2	6.6	8.4	10.0	10.0	-	-	-	9.0	-	-

Source: Field Survey (2006)

As regards cost of projects up to N100 million (Naira); the design-build was rated the most suitable to achieve cost certainty, followed by lump sum contracts, management contracting, direct labour and BOOT system in that order. The results particularly for design-build, lump sum contracts, and management contracting agree with the order of rating in Love et al's [19], Chan's [20] and Kumarawany and Dissanayaka's [21]. This reinforces the perception that clients use the design-build method to limit cost of project. The perception of public clients for the BOOT system's ability to achieve cost certainty is however contrary to Adeagbo and Kolawole's [18] findings. To them for a BOOT project the developer is able to control cost because the financial expenditure is closely monitored during project implementation.

As regards quality, public clients rated the BOOT system as the most able in achieving quality criterion, followed by direct labour system, management contracting, design-build and lump sum contracts for project up to N100 million (Naira). This result particularly for the lump sum contracts seems to contrast those of Love et al [19], Chan [20] and Kumaraswamy and Dissanayaka [21]. In their works clients rated lump sum contracts as the most suitable procurement option to achieve higher quality level followed by management contracting and the design-build.

Private clients believe that among all the procurement options rated, design-build is the most suitable to achieve speed. The result is unlike the rating by public clients who believe lump sum contracts is the most able to achieve speed. This means public clients and private clients do not agree on the performance of the procurement options on speed except the BOOT system, which was ranked the least able by both clients.

As for cost certainty for projects up to N100 million (Naira), design-build and management contracting were ranked first followed by lump sum contracts.

Direct labour and the BOOT system were ranked equally the least able to achieve cost certainty.

As regards quality, private clients ranked design-build most able to achieve high quality standard followed by lump sum contracts, management contracting, direct labour system while BOOT system was ranked the least able for projects up to N100 million (Naira). A study by Ojo [2] revealed that clients were highly satisfied with their design-build projects than other projects implemented using other procurement options. But Kumaraswamy and Dissanayaka [21] believe that quality standard can be compromised in design-build projects particularly when the client does not have a representative on the project.

### Mean Performance Indices

The arithmetic mean has been criticized as not fully representing data particularly if the data have high standard deviations [22]. It was observed from the frequency run on the data that some of the variables had high standard deviations. Hence a standardized ratio advocated by Lehmann [23] was performed on the data. The concept described by equation 2 was used to form the mean performance indices for the procurement options on each criterion for all cost categories.

$$\text{Mean Performance Index} = \frac{\text{Mean}}{\text{Standard deviation}} \quad (2)$$

The standardized ratio has been used in the theory of structural reliability where reliability index is the ratio of mean to standard ratio [24,25]. In their studies any reliability index of above three was good, four was very good and five, excellent. This was adopted in this study, hence any mean performance index on a criterion above three means good performance by the procurement options. Tables 6, 7, 8 and 9 indicate mean performance indices by public clients, private clients, consultants and contractors respectively.

**Table 6.** Mean performance index by public clients

Selection criteria	Lump Sum Contract			Design-Build			Management Contracting			Direct Labour			BOOT		
	10m	101m	Above 10m	10m	101m	Above 10m	10m	101m	Above 10m	10m	101m	Above 10m	10m	101m	Above 10m
	100m	500m	500m	100m	500m	500m	100m	500m	500m	100m	500m	500m	100m	500m	500m
1. Speed	2.0	1.9	1.9	1.8	1.8	1.9	1.9	1.8	1.8	1.8	1.8	1.8	2.1	2.1	2.1
2. Cost Certainty	2.0	1.9	1.8	1.9	1.9	1.9	1.9	1.8	1.8	1.7	1.8	1.7	1.9	1.9	1.9
3. Time Certainty	1.9	1.8	1.8	1.8	1.9	2.0	2.0	1.9	1.9	1.9	1.8	1.9	2.3	2.3	2.3
4. Price competition	1.9	1.8	1.9	1.9	1.9	1.9	1.7	1.8	1.8	1.4	1.5	1.5	1.7	1.7	1.7
5. Quality	2.0	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	1.9	1.8	1.8	2.3	2.3	2.3
6. Risk Avoidance (time)	1.9	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.7	1.7	1.7	2.2	2.2	2.2
7. Risk Avoidance (cost)	2.0	1.9	1.9	1.8	1.8	1.8	2.0	1.9	1.9	1.7	1.6	1.7	2.1	2.1	2.1

Source: Field Survey (2006).

**Table 7.** Mean performance index by private clients

Selection criteria	Lump Sum Contract			Design-Build			Management Contracting			Direct Labour			BOOT		
	10m	101m	Above 10m	10m	101m	Above 10m	10m	101m	Above 10m	10m	101m	Above 10m	10m	101m	Above 10m
	100m	500m	500m	100m	500m	500m	100m	500m	500m	100m	500m	500m	100m	500m	500m
1. Speed	1.9	1.8	1.9	1.9	1.9	2.0	1.9	2.1	2.4	1.9	2.2	2.7	3.0	3.0	3.6
2. Cost Certainty	2.0	1.9	2.0	2.0	2.0	2.1	1.9	2.1	2.4	1.9	2.4	2.7	3.0	3.0	3.6
3. Time Certainty	1.9	1.8	1.9	1.8	2.0	2.0	1.9	2.1	2.2	2.0	2.3	2.6	2.9	3.0	3.6
4. Price competition	1.9	1.8	1.9	1.8	2	2	1.9	2.1	2.2	2	2.3	2.6	2.9	3	3.6
5. Quality	2.0	1.9	2.0	1.9	1.9	2.0	1.9	2.1	2.4	1.9	2.4	2.6	2.7	2.8	3.6
6. Risk Avoidance (time)	1.9	1.8	1.9	1.9	1.7	2.1	1.8	2.1	2.4	1.9	2.3	2.6	2.8	3.0	3.5
7. Risk Avoidance (cost)	1.9	1.9	1.9	1.8	1.8	1.9	1.8	2.1	2.4	1.9	2.3	2.6	2.6	2.9	3.6

Source: Field Survey (2006).

**Table 8.** Mean performance index by consultants

Selection criteria	Lump Sum Contract			Design-Build			Management Contracting			Direct Labour			BOOT		
	10m	101m	Above 10m	10m	101m	Above 10m	10m	101m	Above 10m	10m	101m	Above 10m	10m	101m	Above 10m
	100m	500m	500m	100m	500m	500m	100m	500m	500m	100m	500m	500m	100m	500m	500m
1. Speed	3.0	2.4	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.9	1.8	1.7	1.8	1.9	2.0
2. Cost Certainty	3.1	2.2	1.9	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.8	1.7	1.8	1.9	1.9
3. Time Certainty	2.9	2.2	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.2
4. Price competition	2.5	2.2	1.9	1.8	1.8	1.8	1.9	1.9	1.8	1.7	1.7	1.8	1.8	1.8	1.7
5. Quality	2.7	2.2	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.7	1.8	1.9	1.9	1.9	2.0
6. Risk Avoidance (time)	1.8	1.7	1.6	1.8	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.9	1.9	2.0	2.0
7. Risk Avoidance (cost)	1.9	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.8	1.9	2.0	2.0	2.1	2.2

Source: Field Survey (2006).

**Table 9.** Mean performance index by contractors

Selection criteria	Lump Sum Contract			Design-Build			Management Contracting			Direct Labour			BOOT		
	10m	101m	Above 10m	10m	101m	Above 10m	10m	101m	Above 10m	10m	101m	Above 10m	10m	101m	Above 10m
	100m	500m	500m	100m	500m	500m	100m	500m	500m	100m	500m	500m	100m	500m	500m
1. Speed	1.9	1.9	1.9	1.9	2.5	2.3	1.9	2.7	2.5	-	-	-	4.5	-	-
2. Cost Certainty	1.9	1.8	2.7	1.7	2.3	2.2	1.8	2.7	4.6	-	-	-	4.6	-	-
3. Time Certainty	2.0	2.0	2.4	1.9	2.2	2.2	1.9	2.7	3.3	-	-	-	4.6	-	-
4. Price competition	1.9	1.9	2.4	1.7	2.2	2.2	1.9	2.8	3.3	-	-	-	4.6	-	-
5. Quality	2.0	2.0	2.4	1.9	2.3	2.0	1.9	2.8	2.7	-	-	-	4.6	-	-
6. Risk Avoidance (time)	2.1	2.0	2.5	1.9	2.0	2.3	1.7	2.8	3.3	-	-	-	4.6	-	-
7. Risk Avoidance (cost)	1.8	1.9	2.3	1.8	2.1	1.9	2.0	3.3	3.3	-	-	-	4.6	-	-

Source: Field Survey (2006).

The mean performance indices by public clients in Table 6 indicate poor performance (less than 3) by all procurement options on all selection criteria for all cost categories. However the mean performance indices by private clients (Table 7) indicate a better performance by BOOT system on some selection criteria. For instance the performance of BOOT system on speed and cost certainty is good (an index of 3) on all cost categories. Also the BOOT system had good performance indices on time certainty,

price competition and risk avoidance (time slippage) on project cost of above N100 million (Naira). The mean performance indices by consultants (Table 8) showed that the lump sum contracts had good performances on speed and cost certainty for projects cost of up to N100 million (Naira). Contractors' mean performance indices in Table 9 indicate that BOOT system had a very good (more than 4) performance indices on all selection criteria for projects up to N100 million (Naira).

## Conclusions

This paper reported the performance of procurement methods on selection criteria using the traditional mean and standardized ratio from the rating generated from the survey administered on clients, consultants and contractors.

Results from the traditional mean ranked lump sum contracts most suitable to achieve speed criterion by public clients for projects up to N100 million (Naira). Private clients, consultants, and contractors however rated the design-build option as the most suitable to achieve speed criterion for the same cost category.

As regards cost certainty criterion, clients (public and private) rated design-build as the most suitable to achieve cost certainty for projects up to N100 million (Naira). Consultants however believe it is lump sum contracts while contractors rated the BOOT system as most suitable to achieve cost certainty.

To achieve quality standard, private clients, consultants and contractors rated the design-build option as the most effective while public clients think it is the BOOT system.

Time certainty is always crucial in a project and on this criterion; public clients surprisingly rated the direct labour system as the most effective to achieve construction time certainty for projects up to N100 million (Naira). But private clients rated management contracting and BOOT, consultants, lump sum contracts and management contracting while for contractors it is the BOOT system.

As to which of the procurement options can be used to achieve price competition for projects up to N100 million (Naira), public clients believe it is the lump sum contracts, private clients and consultants believe it is the management contracting while contractors believe it is the BOOT system.

To avoid risk when there is time slippage for projects up to N100 million (Naira), contractors and public clients would use the BOOT system while the private clients would use the direct labour system and consultants, the management contracting option.

Public clients would prefer the use of management contracting option to avoid risk if they envisage cost slippage for projects up to N100 million (Naira). But for contractors, the BOOT system would be used while for consultants, the lump sum contracts. The private clients would either use the management contracting or the BOOT system in such a situation. It was evidence by the results of the study that the Nigerian construction industry participants do not

agree on the performance of the procurement options on selection criteria.

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