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RESEARCH ARTICLE

AN ASSESSMENT OF CONTRACTUAL MODELS FOR BUILDING CONSTRUCTION PROJECTS IN RIVERS STATE, NIGERIA

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ABSTRACT

Selecting the right contractual model is essential for the success of construction projects. This paper reviews commonly used models such as Design-Bid-Build (DBB), Unit Price, Integrated Project Delivery (IPD), and Public-Private Partnership (PPP), pointing out their strengths and weaknesses, as well as their fit for different project conditions. This study adopted a mixed-methods approach that included a literature review, surveys, and expert interviews to assess these models based on criteria like cost, time, risk allocation, quality, and stakeholder collaboration. The results indicate that while traditional models like DBB are still widely used, innovative approaches like IPD and PPP are gaining popularity in tackling modern project challenges.

Keywords: Design-bid-build, unit price, integrated project delivery, public-private partnership, assessment.

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1.0. INTRODUCTION

Construction projects can be quite intricate, and they rely heavily on well-organized contracts to clarify roles, manage risks, and meet project goals. Over the years, we've seen a range of contractual models develop to cater to various project requirements. These range from traditional approaches like Design-Bid-Build to more collaborative or performance-driven models such as Integrated Project Delivery and Public-Private Partnerships (Ashworth, 2010; Walker, 2015). This paper sets out to critically assess these different contractual models within the realm of building construction, looking into how effective they are at achieving desired project results.

2.0. LITERATURE REVIEW

2.1. Design-Bid-Build (DBB)

Design-Bid-Build represents the traditional model for construction contracts, where the design and construction are managed through separate contracts that are awarded in order (Walker, 2015). In this setup, the client first hires a designer to create detailed plans, and then they seek bids from contractors.

2.1.1. Advantages of Design-Bid-Build (DBB)

i. Clear responsibilities and linear workflow.

ii. Competitive tendering may reduce initial costs.

2.1.2. Limitations of Design-Bid-Build (DBB)

i. Longer project duration due to sequential phases.

ii. Limited contractor input during design (Flanagan & Norman, 1993).

2.2. Unit Price Contracts

Unit price contracts involve payment based on actual quantities of work completed, with predetermined unit rates (Hinze, 2011).

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2.2.1. Advantages of Unit Price Contracts

i. Flexibility in handling varying quantities.

ii. Suitable for projects where exact quantities are difficult to estimate.

2.2.2. Limitations of Unit Price Contracts

i. Final cost uncertainty.

ii. Administrative burden in measurement and certification.

2.3. Integrated Project Delivery (IPD)

IPD is an innovative model that promotes early collaboration among stakeholders through a single, multi-party agreement (American Institute of Architects [AIA], 2017).

2.3.1. Advantages of Integrated Project Delivery (IPD)

i. Enhanced collaboration and innovation.

ii. Shared risks and rewards encourage performance.

2.3.2. Limitations of Integrated Project Delivery (IPD)

i. Requires cultural change and trust among parties.

ii. Complex legal framework (Kent & Becerik-Gerber, 2010).

2.4. Public-Private Partnership (PPP)

PPP involves long-term collaboration between public agencies and private sector entities to deliver infrastructure projects (Grimsey & Lewis, 2004).

2.4.1. Advantages of Public-Private Partnership (PPP)

i. Access to private capital and expertise.

ii. Lifecycle cost efficiencies.

2.4.2. Limitations of Public-Private Partnership (PPP)

i. Complex negotiations.

ii. Potentially higher transaction costs.

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3.0. METHODOLOGY

3.1. Study Area

Located in Nigeria's Niger Delta, Rivers State is a powerhouse of economic activity, primarily driven by its oil and gas industry, commercial ventures, and infrastructure projects. The capital city, Port Harcourt, is a thriving urban hub and a centre for construction work. There's a strong need for public infrastructure here, including roads, bridges, schools, hospitals, and government facilities. This environment makes it an excellent place to study contractual models in public procurement for local construction firms.

3.2. Research Design

This paper utilized a mixed-methods strategy, focusing on analyzing contractual models alongside real-world case studies. It features comparative analysis, surveys, and interviews with experts to provide a thorough understanding of the subject matter.

3.3. Population of the Study

The Rivers State Ministry of Works Yellow Paper for 2024 reveals that there are forty-four (44) indigenous construction companies in Rivers State. However, the population comprises those operating at the managerial positions (especially procurement, project, and finance managers), whose activities are directly link with procurement in each construction company in Rivers State. This means our study target at a population of three managers each, making a total population of one hundred and thirty-two (132) managers from the indigenous construction sector in Rivers State.

3.4. Sample size and Sampling techniques

Because the population size is quite small, this study chose a census method known as the Complete Enumeration Survey Method. this technique involves collecting data from every single item in the population (Kish, 1979). In this case, all one hundred and thirty-two (132) managers that made up the population were included in the analysis. This method has its benefits, as it can 'enhance accuracy' and 'reduce bias' by studying the entire population before drawing any conclusions. However, due to the high costs and time required, it's reasonable to use this method only when the population isn't too large, when there's enough time to gather data, when a high degree of accuracy is needed, or when there are adequate financial resources (Kish, 1979).

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3.4.1. Construction Companies in Rivers State

Table 3.1: Distribution and Retrieval of Questionnaire Items

S/N	Names of Indigenous Construction Company	Admin. Questionnaire	Retrieved	Not Retrieved	Percentage (%) Retrieved
1	Fisancol Transcontinental Services Ltd	3	3		100.00
2	Anras Nigeria Ltd	3	2	1	66.67
3	Horandez& Detroit Construction Coy	3	3		100.00
4	Kon-X Group	3	3		100.00
5	Megastar Technical and Constr. Coy.	3	3		100.00
6	Setraco Nigeria Ltd	3	2	1	66.67
7	Waterock Global Development Coy	3	3		100.00
8	Chronax Nigeria Limited	3	2	1	66.67
9	Dewhyno Engineering Ltd	3	3		100.00
10	Geoplus Civil Engineering Resouces	3	1	2	33.33
11	Germain's Construction Nigeria Ltd	3	3		100.00
12	Handyman Construction Nigeria Ltd	3	3		100.00
13	Works Vibrated Blocks	3	2	1	66.67
14	Mercury Engineering and Construction	3	3		100.00
15	Ironinnaija Ltd	3	2	1	66.67
16	Metojen Construction Coy Nigeria Ltd	3	3		100.00
17	Monier Construction Coy Nigeria Ltd	3	3		100.00
18	My Wari Construction	3	3		100.00
19	Taitor Construction Services Ltd	3	2	1	66.67
20	Tancong Global Resources	3	3		100.00
21	Teacon Plumbing Engineering	3	3		100.00
22	Ponticelli Nigeria Limited	3	3		100.00
23	Expert Construction Company	3	3		100.00
24	Fountain Construction Company	3	2	1	66.67
25	FTZ Construction	3	3		100.00
26	Megastar Technical & Construction Company	3	2	1	66.67
27	Comag Steel & Construction Coy.	3	3		100.00
28	Lubrik Construction Company	3	3		100.00
29	Leo9 asphalt and construction	3	2	1	66.67
30	Evomec Global Services Ltd	3	3		100.00
31	Alcon Construction Company	3	3		100.00
32	Rodnab Construction Limited	3	3		100.00
33	RCC Company	3	1	2	33.33
34	Est Master Construction Ltd	3	1	2	33.33

35	Jeftoni Nigeria Ltd	3	2	1	66.67
36	O.K.Isokariari and Sons (Nig) Ltd	3	3		100.00
37	Adroit Landstyle Limited	3	2	1	66.67
38	Fisancol Transcontinental	3	3		100.00
39	Darycet International Limit	3	3		100.00
40	Chinmark Group	3	3		100.00
41	Speckdec Constructions Co. Ltd	3	2	1	66.67
42	Calm Storm Global Resourc	3	1	2	33.33
43	Reason Engineering and C	3	3		100.00
44	Alcon Nigeria Ltd	3	3		100.00
	TOTAL	**132**	**112**	**20**	**84.85**

Source: Field Survey (2024).

3.5. Method of Data Collection

Data for the study were collected primary sources.

3.5.1. Primary Source of Data

Primary data were collected through a designed questionnaire distributed to the respondents. We employed the use of a structured questionnaire following the recommendations/ guidelines of scholars such Grimsey & Lewis (2004), and Sekaran and Bougie (2010).

3.5.2. Questionnaire Design

The questionnaire that was used for this study was structured into two different sections. Section A was structured to provide demographic information about the respondents, while section B was used to extract data on the study variables, using the five (5) point Likert scale (ranging from 1: strongly disagree, 2: disagree, 3: neutral, 4: agree and 5: strongly agree), will be used to measure responses from respondents.

3.6. Method of Data Analysis

After collecting data from a representative sample, the logical next step in our research was to analyze the data and interpret the results (Ahiauzu & Asawo, 2016). The quantitative data generated was sorted, coded, and entered by the data editor using the Statistical Package for Social Sciences (SPSS 23.0). We used descriptive statistics like means, frequency distribution tables, percentages, and charts to examine the demographic data. To assess the different contractual models presented in this paper, we applied correlation analysis.

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3.7. Assessment Criteria

The models were assessed using the following criteria:

i. Cost performance (budget adherence)
ii. Time performance (schedule adherence)
iii. Risk allocation effectiveness
iv. Quality outcomes
v. Level of stakeholder collaboration

4.0. RESULTS AND DISCUSSIONS

4.1. Results and discussions of Demographic Data of Respondents

The sample size for this study is 132, but the analyses were based on the 112 subjects who responded to and returned the questionnaires. The results are presented in what follow.

Table 4.1.1: Distribution of Respondents Qualifications

Qualification		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	OND/NCE	7	6.3	6.3	6.3
	BSc/HND	66	58.9	58.9	65.2
	MSC	30	26.8	26.8	92.0
	PhD	9	8.0	8.0	100.0
	Total	112	100.0	100.0	

Source: Authors' Analysis (2025).

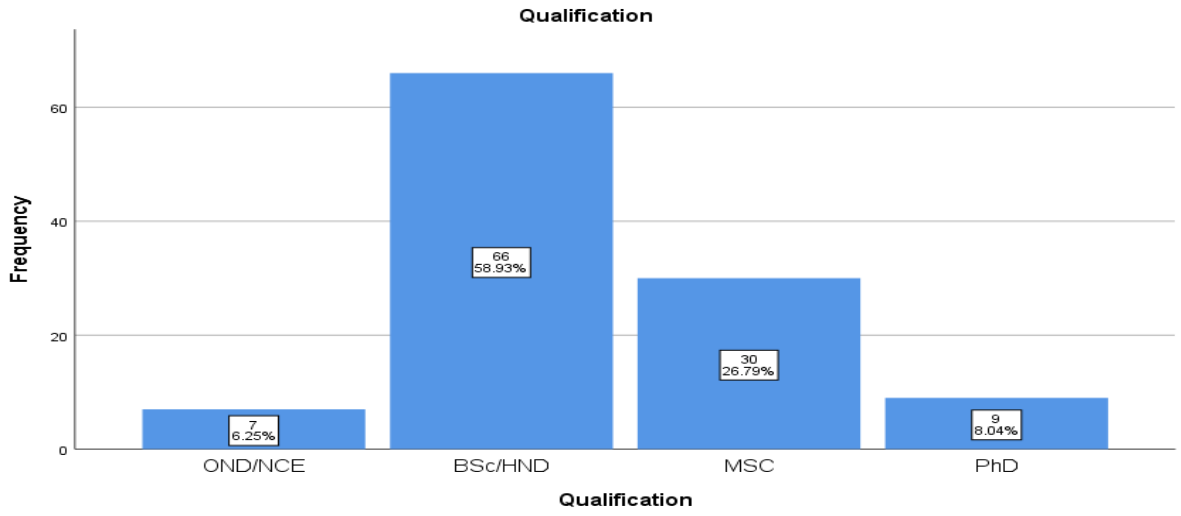

Figure 1: Distribution of Respondents' Academic Qualifications

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The results summarized in Table 4.1 and Figure 4.1.1 respectively, show that 7 persons representing 6.3 percent of the respondents have OND/NCE, 66 persons (58.9 percent) have BSc./HND, 30 persons representing 26.8 percent have MSc while 9 persons representing 8 percent have PhD. Comparatively, the most dominant qualification possessed by the respondents is Bachelor Degree, followed by M.Sc.

Table 4.1.2: Distribution of Respondents Sex

	SEX	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	88	78.6	78.6	78.6
	Female	24	21.4	21.4	100.0
	Total	112	100.0	100.0	

Source: Authors' Analysis (2025).

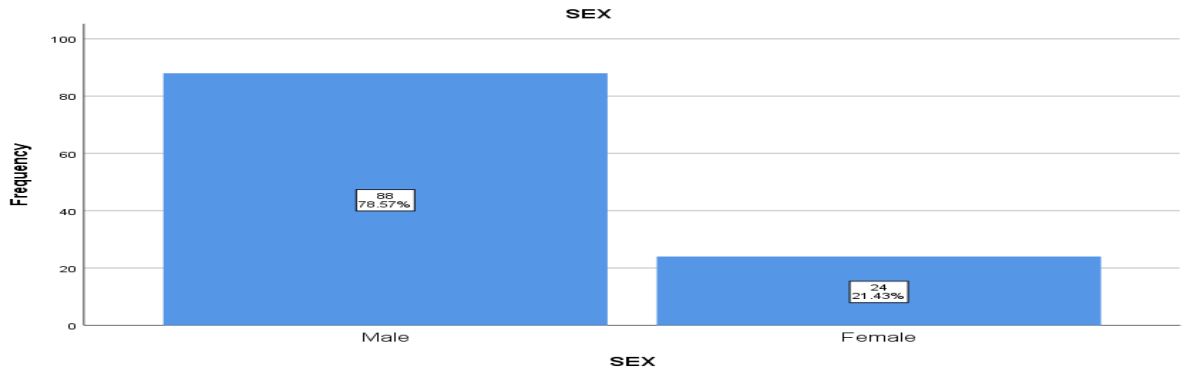

Figure 2: Sex Composition of the Respondents

The results presented in Table 4.1.2 and Figure 2 reveal that 88 persons representing 78.6 percent of the respondents are male while 24 persons representing 21.4 percent are female. This demographic data reveals that the respondents are composed of greater number of males.

Table 4.1.3: Distribution of Respondents Roles

Role		Frequency	Percent	Valid Percent	Cumulative (%)
Valid	Public Procurement Officer	20	17.9	17.9	17.9
	Project Manager	33	29.5	29.5	47.3
	Contractor	23	20.5	20.5	67.9
	Architect/Consultant	21	18.8	18.8	86.6
	Legal Advisor	15	13.4	13.4	100.0
	Total	112	100.0	100.0	

Source: Authors' Analysis (2025).

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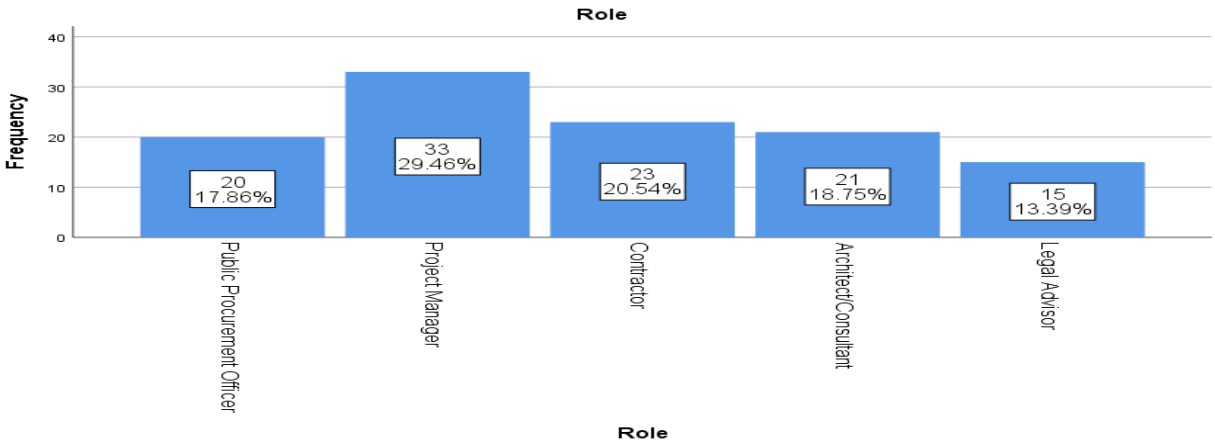

The results presented Table 4.1.3 and Figure 3 show that 20 persons representing 17.9 percent of the respondents are procurement officers, 33 persons are project managers, 23 persons are contractors, 21 persons respectively. The each group depicts a distinct proportion in the series as exemplify by 18.75 percent for Architect/Consultants while Legal Advisors are 15 persons representing 13.4 percent.

Table 4.1.4: Distribution of Respondents Years of Experience

Years of Experience		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 5 years	16	14.3	14.3	14.3
	5 – 10 years	23	20.5	20.5	34.8
	11 – 15 years	39	34.8	34.8	69.6
	16 – 20 years	15	13.4	13.4	83.0
	Over 20 years	19	17.0	17.0	100.0
	Total	112	100.0	100.0	

Source: Authors' Analysis (2025).

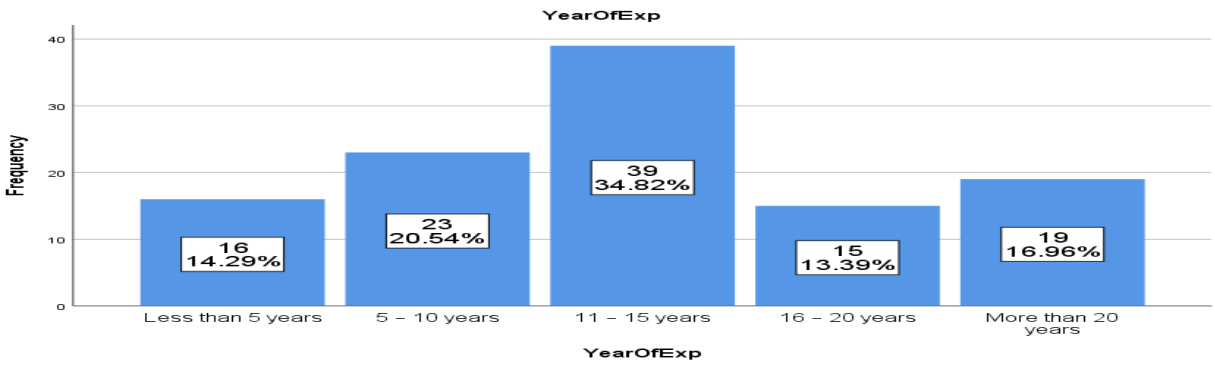

Figure 4: Analysis of Respondents' Work Experiences.

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The table above shows that 16 persons representing 14.29 percent of the respondents have less than 5 years of experience, 33 persons have between 5 to 10 years of experience, 39 persons representing 34.8 percent of the population have 11 to 15 years of experience, 15 persons have 16 to 20 years of experience while 19 persons representing 16.96% have more than 20 years of experience.

4.2. Results and Discussions on the Assessment of Contract Models

The IPD model has proven to be more effective in terms of cost and time, largely because of its collaborative practices. Meanwhile, DBB has its traditional advantages, especially in clarifying roles and responsibilities, but it tends to struggle with meeting schedules. PPP, on the other hand, is great at providing quality infrastructure, though it does come with a higher level of initial complexity.

Table 4.2: Analysis of Contract Characteristics, Risks and Performances

	Cost Performance	Time Performance	Risk Allocation	Quality	Collaboration
DBB	Moderate	Low	Owner-heavy	Good	Low
Unit Price	Moderate	Moderate	Shared	Moderate	Low
IPD	High	High	Shared-balanced	High	High
PPP	High (long-term)	High	Private-heavy	High	Moderate

Source: Authors' Analysis (2025).

For simpler projects where the design is well-defined, DBB works well, but for those complex or large-scale projects that require a lot of integration and innovation, IPD and PPP are better suited (Kent & Becerik-Gerber, 2010; Grimsey & Lewis, 2004). When it comes to projects with uncertain quantities at the time of contract, unit price contracts are the way to go. This analysis highlights that the choice of contractual model should be based on the project's objectives, its complexity, and how much risk the stakeholders are willing to take.

5. CONCLUSION

It is clear from the preceding discourses that there is no perfect contractual model that fits every situation; each has its unique benefits based on the context. It is crucial for project teams to thoroughly analyze the project details and the priorities of everyone involved before

deciding on the contractual model to be used. In the future, research should focus on hybrid models and how they can work in emerging markets.

Competing Interest

The authors have declared that no competing interest exist in this paper.

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