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# Comparative Assessment of Causes of Delay in Public and Private Building Projects in Lagos State, Nigeria

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Abstract: Delay in the execution of construction projects is a major problem confronting the Nigerian construction industry. If unchecked, it will constitute a setback to the realisation of the infrastructure development component of the sustainable development agenda of the United Nations. This paper compared the causes of delay in public and private building projects in Lagos State, Nigeria with a view to enhancing project time performance. The study was conducted using a random sample of 87 Architectural firms and 88 contracting firms out of a population of 289 and 293, respectively in the study area. These represent 30% of the population of Architectural and contracting firms, in the study area. Data were retrieved from 47 Architectural and 48 contracting firms and analysed using mean score and student t-test. Results from the study indicated that delay in public building projects was mostly due to contractor's financial difficulties with mean score (MS) of 2.84, rise in materials prices (MS = 2.80) and variations (MS = 2.72). On the other hand, client's interference (MS = 2.92), rise in materials prices (MS = 2.83) and slow decision by clients (MS = 2.74) were the major causes of delay in private projects. T-test also revealed that the respondents were significantly different in opinion on 12 out of the 30 causes of delay in both project types in the study area.

Keywords: Causes, Delay, Private, Projects, Public

### I. Introduction

Within the context of construction projects, several authors have defined delay. [1] defined delay as the situation whereby a contractor, consultant and client jointly and severally contribute to the non-completion of a project within the agreed schedule or contract period. [2] defined delay as something happening at a later time than planned, expected and specified in a contract or beyond the date agreed upon for delivering of a project. [3], defined delay as the time elapse between the agreed date for completion and the actual date of completion.

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Several authors use delay interchangeably with time overrun.

Delay has been categorised to include excusable and non-excusable, compensable and noncompensable, critical and non-critical, or concurrent and non-concurrent delays [4], [5] and [6]. Irrespective of the type of delay, there is a general consensus hat delay is not only a global phenomenon but also one which poses a threat not only to the contractual parties construction projects also but the construction industry and national economy at large. Consequently, efforts geared towards reducing the occurrence of construction delay will contribute immensely to the better performance of the industry. However, delay cannot be reduced without a knowledge of its causes, hence this study.

The construction industry has been criticised for its high incidence of delay. In Nigeria, for example, [7] found that 70% of construction projects executed in Nigeria suffered delay. [8] claimed that delay in the execution of construction projects was a major problem confronting the Nigerian construction industry. [9] stated that delay ranks very high in project execution in Nigeria. The authors opined that if construction delay was not properly managed, it could lead to reduced profit for the contractor and project abandonment for the client. However, [10] observed that the degree of delay in the construction industry vary considerably from project to project. Hence the need to compare the causes of delay in public and private building projects in the study area.

Several studies have been carried out on the causes of delay in construction projects worldwide. These include the most recent studies of [2,4,5,9,11,12]. However, each of these studies was either limited in scope in terms of subject matter or in terms of geographical coverage.

[4] evaluated the causes and effects in construction projects in Lagos State. The study which was an empirical investigation of contractors' opinion on the subject matter elicited data from 86 construction firms using questionnaire survey. The questionnaire comprised 32 causes of delay synthesised from literature. The data collected were analysed using relative importance index. Based on the results of the analysis, the authors concluded that the lead causes of delay in construction projects in the study area were cash flow problems, client's financial difficulty, procurement poor arrangement and inadequate skilled labour. It is however noteworthy that the study was not project specific as it related to construction

projects in general. Besides, the data for the study were collected from contractors alone based on which the above conclusions were drawn. There was hence the need to compare the delay profiles of project types. Moreover, there was the need to also assess the opinions of Architects who are major stakeholders in extension of time of construction projects beyond agreed completion date.

[5] was on the causes and effects of delay in construction projects executed in Akure, Ondo State, Nigeria. The authors employed purposive sampling technique to survey the opinions of 60 respondents comprising construction clients, consultants and contractors in the study area on the causes of delay. From the analysis of data collected for the study, the authors reported three major causes of delay out of the 28 causes investigated. These major causes were poor site management, inadequate contractor's experience and client's financial difficulties. There was however the need to investigate the causes of delay in a study area with more volume of construction projects like Lagos State. It was also necessary to assess the degree of delay in project types like public and private building projects. This will help in ascertaining were corrective actions are required.

[2] studied the causes and effects of delay in construction projects in India. The study employed a questionnaire survey to elicit data from 20 respondents on 31 causes of delay in the study area. After analysis of the data collected, the authors reported that inadequate planning and scheduling by contractor, rise in the prices of materials and client's delay in giving approval to documents were the major causes of delay. Notwithstanding the fact that the study was carried out in a developing country like Nigeria, there was the need to replicate the study in

Nigeria so as to document the findings as they apply to our local peculiarities. Besides, the study was not specific in terms of projects types and nature of respondents.

[11] studied the causes of time overrun in building projects in Nigeria with a view to attracting stakeholders' response which could enhance project time performance. Random sampling technique was used by the authors to select 90 respondents from consulting and contracting firms in the study area. The study used 64 causes of time overrun synthesised from extant literature to elicit data from the sampled firms via a questionnaire survey. Mean score ranking was used to analyse the data to establish the causes of time overrun perceived by both groups. Spearman's rank correlation was subsequently used to compare the rankings of the cause of time overrun in the study area by both groups of respondents. The authors concluded that both groups were unanimous that time overrun in building projects in the study area was mostly due to three lead causes. These were financial difficulties, incomplete details and clients' interference. However, the study did not investigate the causes of time overrun on the basis of specific project types as done in this present study.

The study of [9] was an investigation into the causes and effects of delay on building construction projects delivery in Nigeria. The authors employed random sampling technique to select 150 construction professionals for the study. Mean score index was used to analyse the 90 suitable copies of questionnaires retrieved from the respondents. After analysis, the authors concluded that inadequate finding, changes in scope and inadequate communication amongst team members were the major causes of delay in the study area. It was pertinent to note that the

sample size of the study was too small to be used to generalise Nigeria as a whole on the issue of causes of delay. Hence, there was the need to limit the study to more homogenous location like Lagos State. Moreover, it was necessary to match the causes of delay with specific project types as done in this study.

[12] investigated delay factors and their effects on the completion of construction projects in Pakistan. The authors used email to administer 200 questionnaires on government, private and semi-government organizations out of which 120 were retrieved and used for analysis. Overall, 41 causes of delay grouped into seven factors were used for the study. The authors reported that the most common factors of delay in construction projects in Pakistan were natural disasters like flood and earthquake. Moreover, the findings indicated that majority of delay factors were traceable to client factor.

The fore goings have presented some of the most recent studies on construction delay around the world. From the studies, a number of gaps have been identified. First, some of them were carried out offshore. These needed to be replicated in Nigeria so as to domesticate the causes of delay to specific geographic context. Lagos State being the economic hub of Nigeria was hence the focus of this study. Secondly, most of the studies were not specific in terms of project types. It was hence necessary to document the causes of delay not only on building projects but also on public and private building projects, for that matter. It was on the strength of the above gaps in literature that this study compared the causes of public and private building projects in Lagos State, Nigeria with a view to enhancing time performance of building projects.

## II. Materials and Methods

The study population comprised 289 consulting firms of Architects in Lagos State [13] and 293 contracting firms registered with Lagos State Public Procurement Agency [14]. A sample size of 87 Architectural and 88 contracting firms representing 30% each of the population was selected randomly for the study. These responding firms were selected for the study because it was necessary to investigate the causes of delay using the major stakeholders on the subject matter hence the selection of contractors and Architects for the study. On the one hand, contractors are the contractual party responsible for delivering construction projects at the date for completion.

On the other hand, project Architects are the ones who grant extension of time (time overrun) after due consideration of the relevant events causing delay. Data were collected from the respondents via a structured questionnaire. The questionnaire elicited information on 30 most frequently reported causes of delay synthesized from literature. The respondents were required to score the causes of delay on a five-point scale (5 for very high, 4 moderately high, 3 for high, 2 for low and 1 for very low). A total of 47 and 48 copies of questionnaire were retrieved for analysis. These represent a response rate of 54.55%, 54.02% and respectively for Architectural and contracting firms. The data were analysed using mean score ranking and paired sample t-test. Lagos State was selected for the study due to the acute housing shortage in the State which has led to deteriorating living conditions among the populace. [15] reported that between 68 and 70% of Lagos population lived in slums. There is hence an urgent need to build more housing units to accommodate the teeming population. Similarly, educational

buildings will be needed in the State to meet the needs of children and youths of school age.

However, for the above to be realized, the challenge posed by delay and, by extension, cost overrun, need to be nipped in the bud. This need becomes more apt when viewed from the angle of enhanced provision of adequate housing and infrastructure which is one of the critical targets of the sustainable development agenda of the United Nations (2015 - 2030).

#### III. Results and Discussion

Regarding the profiles of the respondents, Table 1 shows their academic and professional qualifications as well as their experience. On qualification, 98.9% of the respondents had requisite academic qualifications while 93.7% professional qualifications. had cognate Similarly, none of the respondents had less than an average of 11 years working experience in the construction industry. They have also handled an average of 12 projects in the last five years. As such, the data supplied by the respondents were deemed reliable enough to be used to generalise the findings on the objectives of this study in the study area.

Table 2 shows the causes of delay in public and private building projects in the study area. Accordingly, 11 out of the 30 causes of delay investigated were significant for public buildings (with a mean score greater than 2.50 on five point likert-like scale). These causes were contractors' financial difficulties with a mean score (MS) of 2.84. It was closely followed by rise in prices of materials and changes in government regulation and laws (MS=2.80), respectively, variations (MS=2.72), slow decision making by client (MS=2.67), cash flow problems (MS=2.64), lack of effective communication among the parties involved (MS=2.63), ineffective planning and scheduling by contractor (MS=2.62), inadequate information from consultants (MS=2.61) and incomplete drawing/details (MS=2.55).

Table 1: General Information of Respondents

Table 1. General III		% of	Cumulative		
Category	Frequency	Total	0/0		
Nature of					
Respondents					
Contracting Firms	48	50.5	50.5		
Architectural Firms	47	49.5	100.0		
Total	95	100.0			
Academic					
Qualifications					
HND	19	20.00	20.00		
B.Sc./B. Tech.	39	41.05	61.05		
M.Sc./M. Tech.	36	37.90	98.95		
Unspecified	1	1.05	100.0		
Total	95	100.0			
Professional					
Qualifications					
MNIQS	25	26.3	26.3		
MNIA	40	42.1	68.4		
Probationer MNIQS	3	3.2	71.6		
MNIOB	10	10.5	82.1		
MNSE	11	11.6	93.7		
Unspecified	6	6.3	100.0		
Total	95	100.0			
Years of Experience					
0-5	14	14.7	14.7		
5-10	38	40.0	54.7		
10-15	23	24.2	78.9		
15-20	15	15.8	94.7		
>20	5	5.3	100.0		
Total	95	100.0			
Projects Handled					
1-5	9	9.5	9.5		
6-10	35	36.8	46.3		
11-15	22	23.2	69.5		
16-20	12	12.6	82.1		
>20	10	10.5	92.6		
Unspecified	7	7.4	100.0		
Total	95	100.0			

Mean=11 years (Experience) Mean=12 (Projects Handled)

On the other hand, eight causes of delay were significant for private building projects executed in the study area. These were clients' interference (MS=2.92), rise in prices of materials (MS=2.83), slow decision making by client (MS=2.74), variations (MS=2.69), inadequate information from consultants (MS=2.68), cash flow problems (MS=2.60), contractors' financial

difficulties (MS=2.54) and lack of effective communication among the parties involved (MS=2.51). It is worthy to note that the significant causes of delay in both project types are largely the same. This is because seven out of the eight significant causes of delay in private projects are also among the eleven significant causes of delay in public projects.

The results of this study compared fairly well with those of previous studies. The findings were in agreement partly with [1, 2, 9, and 11]. [1] reported that cash flow problems, improper project planning and scheduling, contractors' financial difficulties amongst others, were the significant factors which cause delay in building projects. Similarly, [2] also agreed that ineffective planning and scheduling by contractors, variations and rise in prices of materials were the significant factors causing delay in building projects.

In addition, [11] concluded that the significant factors causing time overrun in building projects were incomplete drawings/details, contractors' financial difficulties, clients' interference and slow decision making by client. [9] also reported that lack of effective communication among the parties involved, inadequate information from consultants, slow decision making by client, contractors' financial difficulties, variations, ineffective planning and scheduling by contractor amongst others were the significant factors which causes delay in building projects.

However, a number of the above findings were expected. For example, it is expected that there will be slow decision making by clients, contractors' financial difficulties, cash flow problems and ineffective planning and scheduling by contractors in public projects. This is because in a political dispensation, the

Table 2: Causes of Delay in Building Projects

Causes	All		Public		Private		T-Test
	MS	R	MS	R	MS	R	P-value
Rise in prices of materials	2.81	1	2.80	2	2.83	2	0.840
Slow decision making by client	2.70	2	2.67	5	2.74	3	0.583
Variations	2.70	2	2.72	4	2.69	4	0.779
Contractors' financial difficulties	2.69	4	2.84	1	2.54	7	0.009*
Inadequate information from consultants	2.65	5	2.61	9	2.68	5	0.576
Cash flow problems	2.62	6	2.64	6	2.60	6	0.781
Clients' interference	2.62	6	2.32	21	2.92	1	0.000*
Ineffective communication among parties involved	2.57	8	2.63	7	2.51	8	0.147
Ineffective planning and scheduling by contractor	2.52	9	2.62	8	2.42	11	0.036*
Changes in government regulations and laws	2.52	9	2.80	2	2.25	18	0.000*
Incomplete drawings/details	2.49	11	2.55	10	2.44	9	0.303
Bad weather	2.43	12	2.41	17	2.44	9	0.859
Inadequate fund allocation	2.40	13	2.50	12	2.30	15	0.101
Natural disasters	2.39	14	2.39	20	2.39	13	0.754
Poor site management and supervision	2.38	15	2.43	16	2.33	14	0.404
Mistake and discrepancies in contract documents	2.37	16	2.55	10	2.19	21	0.000*
Difficulty in ground conditions	2.37	16	2.49	14	2.25	18	0.002*
Late delivery of material	2.36	18	2.44	15	2.28	16	0.100
Change orders	2.29	19	2.50	12	2.07	26	0.000*
Clients' financial difficulties	2.27	20	2.13	28	2.41	12	0.026*
Late approvals by owners	2.25	21	2.41	17	2.09	24	0.004*
Low level of productivity	2.24	22	2.41	17	2.08	25	0.004*
Poor procurement	2.23	23	2.18	24	2.27	17	0.522
Frequent equipment breakdown	2.22	24	2.25	22	2.20	20	0.500
Inadequate contractors experience	2.17	25	2.15	27	2.18	22	0.798
Failure/Non availability of equipment	2.14	26	2.16	25	2.12	23	0.604
Confinement of site	2.05	27	2.21	23	1.90	29	0.014*
Inappropriate project structure	1.96	28	1.96	29	1.96	27	1.000
Shortage of skilled labour	1.95	29	1.96	29	1.95	28	0.875
Labour strike	1.82	30	2.16	25	1.49	30	0.000*

\* Significant at 5% level

award of contracts is largely based on political patronage. Consequently, projects are expected to be awarded to political supporters who, in several situations may not possess the requisite knowledge to manage construction projects. This will definitely lead to ineffective planning and scheduling in the execution of public projects. Secondly, government business is known to be full of bureaucracy in decision making procedures. As such, things like honouring of valuations are common place with attendant cash flow problems and contractors' financial difficulties.

Conversely, it was not expected that rise in materials prices, changes in government regulations and laws, inadequate information from consultants and incomplete details and drawings will be among the significant causes of delay in public building projects. This is because there is statutory provision of not less than 30% advance payment to the contractor before work commences on site. Moreover, it is expected that qualified consultants will be commissioned to handle government projects in line with the transparency and accountability framework of democratic dispensation. Accordingly, consultants are expected to administer the expenditure of such advance payment in such a way that will mitigate rises in the prices of construction Besides, resources. such consultants are supposed to exercise due diligence in the administration of projects by providing adequate and complete design as well as construction information as at when due.

With regard to private projects, it is expected that clients' interference, variations, lack of communication, effective inadequate information from consultants, among other causes of delay will be common place. This will be more so for projects owned by private individuals with little or no management structures for project execution. The case may however be different for projects commissioned by corporate private client organisations. However, slow decision making by clients is not expected to be a significant cause of delay in private building projects owing to the fact that bureaucracy is not so pronounced in private organisations.

Moreover, findings from t-test revealed that there was significant difference (at 5% level) in the respondents' rankings of 12 out of 30 causes of delay in public and private building projects in the study area. In other words, these 12 causes were not perceived to be responsible for delay in the same degree in both project types in the These causes were clients' area. interference, changes in government regulations and laws, mistake and discrepancies in contract documents, change orders, labour strike, difficulty in ground conditions, late approvals by owners, low level of productivity, contractors' financial difficulties, confinement of site, clients' financial difficulties and ineffective planning and scheduling by contractor.

#### IV. Conclusion and Recommendations

Based on the findings from this study, it is concluded that the causes of delay in public and private building projects are largely the same in the study area. However, public building projects suffered from more causes of delay than private. The causes of delay in both public and private building projects in the study area are more of clients and consultants-related than contractorrelated. Consequently, it is recommended that attention should be focused on client's interference, provision of adequate project information by consultants as well as contractor's cash flow in the execution of building projects in the study area. It is also recommended that decision making process and communication should be made to be more effective. Moreover, contractors with requisite capabilities should be engaged to handle the execution of building projects in the study area.

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