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## COST IMPLICATIONS OF DELAY IN PUBLIC SECTOR PROJECTS IN NIGER STATE

**R.A. Jimoh, E.B. Ogunbode**  
Building Department  
Federal University of Technology  
Minna

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**ABSTRACT** *Delay in completion of work and the costs associated with such delays are the most common causes of dispute encountered during the administration of building contracts. The study appraised the cost implication of delay on public sector projects in Niger State. Historical data from 24 projects initiated by the state between 1998-2003 were examined. Also, oral interview was conducted to know the procurement method adopted in the execution of the projects. Cost and time variants were regressed using simple regression analysis to determine whether there was any statistical relationship between them. It was found out that only one of the projects had no cost and time overrun; there was no statistical relationship between cost and time. It is suggested, among other things that a more pragmatic procurement method such as construction management should be adopted.*

### INTRODUCTION

The construction industry unlike many manufacturing situations is concerned with one-off projects. This naturally creates difficulties for effective management control because each new contract often has a fresh management team; labour is transient and recruited on ad-hoc basis; added to all these are the ever-changing weather conditions. Construction projects are intricate and time-consuming undertakings; the total development of a project normally consists of several phases requiring a diverse range of specialized services to realize a finished product—a high-rise building, an airport runway, a bridge or a subsurface tunnel in an urban area. The construction industry plays an important role on the national scene. Not only does it touch the lives of everyone on daily basis, it occupies a fundamental position in the national economy. Periods of national prosperity are usually associated with high levels of construction activities.

Implementing construction projects on time, to specified standard and within budget is very important to make the development pace of a country faster. When these attributes of

management are found in a project, the project is said to be successful. But studies conducted by Gupta (1987), Majid and McAffer (1998), Mbamali and Nnorom (2002), Ibrahim and Mosaku (2002) showed that majority of projects were characterized by cost and time overrun.

### DELAY

Aqua group (1996) stressed that delays in completion of work, and the costs associated with such delays, are the most common causes of dispute encountered during the administration of building contracts. It further stated that delays also represent some of the most justifiable causes of criticism of the building industry. Hence, it is not surprising, that when drafting JCT 80, a particular attention was given to the procedures to be followed when delays occur, or are foreseen, as a result of which the contract period might have been extended.

Delay in implementing construction projects is not completing the entire work within specified time period designated in the contract that is agreed and signed between the employer and the contractor (Baral, 2003). Project delay can occur

either before the actual construction work begins and or during the construction period. The effects of delays are not confined to the construction industry alone but also influence the state of overall economy of a country.

Bhattarai (2003) classified delays under the following.

Classification based upon forecastability

Forecastable delay

Non forecastable delay

Classification based on responsibility

Delay due to employer

Delay due to engineer

Delay to contractor

### **CAUSES OF DELAYS**

JCT (1980) in clause 25 gives comprehensive causes of delay in project delivery and execution as highlighted below

Force majeure

Exceptionally adverse weather conditions

Civil commotion, strike or lockout

The carrying out of, or failure to carry out work by a local authority etc. Odunsanmi and Olusanya (2000) also identified the causes of delays as changed orders (variation); delays in payment of interim certificates; slow decision making; late handover of site; delay in supply of materials proposed by the client; inadequate project planning and selection of consultants and contractors.

### **COST OF DELAY**

Delay in project construction has many costs. Odeyinka and Yusuf (1997), Patel (2000), Bhattarai (2003) believed that delay in implementing projects will have multidimensional and multifaceted effects on the economy of a country and also have many adverse social impacts. Delay in executing any

project will first of all have impact on productivity thereby increasing the cost of production. Some of the costs of delay are highlighted below:

- Interest on invested capital.
- Overhead expenses like wages, salaries, insurance, materials carrying cost
- General price escalation
- Loss of production due to delay
- Opportunity cost
- Loss of reputation of the company in the public eye
- effects on employee morale.

The total cost of delay may turn out to be very high hence the study appraised the cost implications of delay in public sector projects in Niger State.

### **METHODOLOGY**

A total of 24 building projects which were initiated by the Niger State Government from 1998 – 2003 were examined. The data collected were the initial contract sums and initial completion periods obtained from the form of tender and the final contract sums obtained from the final accounts. The final completion periods were obtained from the practical completion certificates. The secondary data collected were subjected to simple regression analysis to determine whether there was statistical relationship between initial contract sum and initial completion time; final contract sum and final completion time. In addition to the data collected, interview was conducted to determine the procurement methods adopted for all the 24 projects, the major cause of the cost differential and the party/ parties responsible for the delay. Based on the results of the analysis of the data, inferences were drawn and recommendations made to help minimize delays in projects.

Table 1: Initial, final and cost differential of the contract sum (in millions of Naira) and initial, final and time differential (in weeks) of the projects.

S/N	Initial contract sum	Final contract sum	Cost differential (final - initial)	Initial completion time	Final completion time	Time differential (final - initial)
1	47.939	51.557	3.618	32	108	76
2	14.652	16.721	2.069	12	44	32
3	5.556	7.282	1.726	6	52	46
4	0.910	2.729	1.819	8	120	112
5	5.700	7.183	1.483	12	96	84
6	5.965	8.238	2.273	24	52	28
7	3.002	7.553	4.551	5	26	21
8	4.307	16.502	12.195	4	20	16
9	9.480	9.667	0.187	12	108	96
10	2.601	3.101	0.500	4	40	36
11	165.359	172.001	6.642	10	31	21
12	3.002	7.553	4.551	4	12	8
13	12.000	51.962	39.962	40	76	36
14	63.878	72.620	8.742	10	36	26
15	20.840	36.853	16.013	8	16	8
16	3.721	3.935	0.214	6	12	6
17	12.514	14.731	2.217	12	80	68
18	20.495	29.728	9.233	16	16	0
19	3.204	4.053	0.849	4	32	28
20	9.000	9.768	0.768	8	20	12
21	5.700	7.183	1.483	12	96	84
22	2.560	3.974	1.414	6	20	14
23	1.920	1.920	0.000	4	4	0
24	4.691	7.563	2.872	12	156	144
Σ	428.996	554.377	125.381			

Source: Niger State Ministry of Works, Department of Building and Arch Services, 2004

Table 2: The respondent answer to the interview conducted

S/N	QUESTION ASKED	RESPONSE
1	Which particular procurement method was adopted for each of the project	Traditional procurement method was adopted for all the projects
2	What were the main causes of the delay in the projects	Variations in design, civil commotion, unrealistic completion time submitted by the contractors
3	Which party/ parties was/ were responsible for the delay	Client e.g. delay in payment as and when due; and contractors e.g. inadequate planning which resulted in submitting unrealistic completion time

Source: authors field work, 2004.

**Table 3: Regression Analysis on the initial contract sums and initial completion times**

Regression equation	R <sup>2</sup>	Fcal	Ftab	Remarks
12.1 + 0.514Incomp	1.8%	0.40	4.30	NS

Incomp – Initial completion times

NS – Not significant

**Table 4: Regression Analysis on the final contract sums and the final completion times**

Regression equation	R <sup>2</sup>	Fcal	Ftab	Remarks
27.1 – 0.075Fcomp	0.7%	0.16	4.30	NS

Fcomp – Final completion times

NS – Not Significant

### RESULTS AND DISCUSSION

The summaries of the results obtained were analyzed and are presented below. Table 1 shows that the total cost differential of the 24 projects examined is one hundred and twenty-five million, three hundred and eighty one thousand naira (# 125, 381, 000.00k). This amount is due mainly to variation, which validates earlier studies of Mbamali and Nnorom (2002). This trend will continue as long as designs and analysis of contracts are hastily done without adequate planning for operational modalities.

The amount involved is considerable and could have been used in the provision of infrastructure and would also translate into awarding more contracts and by extension, the boosting of the state's economy. In table 3, R<sup>2</sup> value (coefficient of determination) of 0.018 shows that only 1.8% of the variation in the initial contract sums is explained for by the initial completion times. Since F-tabulated of 4.30 is greater than 0.40, the relationship is statistically not significant. Of note is that all the projects examined, the traditional procurement method was used which many authors agreed is fraught with inadequacies (Ojo, 1999; Wahab, 2002).

Table 1 also shows the time differential of all the 24 projects examined. Only 2 had no time differential, this is a far cry from the total number of projects.

From the time differential of the projects, one thing comes to the fore. It will not be out of

place to say that much commitment is not shown when estimating the duration of a project unlike when estimating the cost of a project. Clough and Sears (1979) emphasized that it is important that someone experienced in and familiar with the type of work involved be consulted when the activity durations are being estimated. Input from field superintendents is valuable and desirable, but it would be a mistake to allow them to make all the duration estimates themselves in an informal fashion.

According to Bamisile (2004), a good construction programme is one, which has the following attributes;

Its preparation is not guesswork but based on facts and figures from the working drawings and construction methodology for the project.

It has to be flexible so that it can be easily updated with changing circumstances.

Easily adapted for progress monitoring

The R<sup>2</sup> value of 0.007 shows that only 0.7% of the variation in the final contract sums is explained for by the final completion times. Since F-tabulated of 4.30 is greater than F-calculated of 0.16, the relationship is not significant. Remarks in tables 3 and 4 show that the relationship between the contract sums and completion times is statistically not significant.

This further buttresses the assertion that the completion times were not a serious factor in arriving at the contract sums, hence the very low

coefficient of determination as shown in the tables.

### CONCLUSIONS

A system cannot function properly without feed back, and the construction process is a system. The present system of construction process in Nigeria allows communication to work in one direction only especially in the public sector that adopts traditional procurement system. Thus while design affects construction planning, construction has not been allowed to affect design, the attendant consequences are variations, increased cost and time overrun as is evident in the results obtained. Adequately prepared programme is supposed to help the contractor in the timely completion of the project. The results showed that no adequate planning was done hence the huge differences experienced between the initial and the final completion times.

### RECOMMENDATIONS

It is very common that construction projects are delayed, in the light of this, the following recommendations are made: Governments should adopt a better procurement methods such as management contracting, construction management etc in the execution of their projects instead of the traditional procurement method. Governments should avoid the habit of varying contract works significantly as this leads to cost and time overruns. To curb this, builders should be brought in early enough so that they can advise on the buildability of projects. In essence, there should be collaborative efforts between the design team and construction team.

More time should also be spent on estimating time for the project and this should not be based on guesswork but on facts and figures.

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