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ANALYSIS OF THE IMPACT OF CLAIMS ON THE FINAL COSTS OF BUILDING CONSTRUCTION IN NIGERIA - A CASE STUDY OF SELECTED PUBLIC BUILDING PROJECTS

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ABSTRACT

Most public building projects in Nigeria have a difference between their tender/initial contract sums and final construction costs, and this difference is often caused by claims. Where not properly handled, these claims lead to delays, disputes and sometimes project abandonment. The effects of claims cost on the delivery of public building projects in Nigeria have long been a source of concern to stakeholders. In view of this, the study sought to analyze the impact of claims on final cost of public building projects in Nigeria via ascertaining the percentage contribution of claims in the final cost of public building projects, identifying the most common type of claims and their cost implications and finally, determining the relationship between claims and final cost of public building projects. Data on ten public building projects of varying characteristics were collected, five from Delta State and five from Anambra States, while simple percentage index and the Pearson correlation co-efficient (r) were used to analyze the data. Results/findings obtained, indicates that claims account for about 25% of the increase in costs of the surveyed public building projects, the most frequent type of claims experienced on these projects are variation claims (53.84%) and a strong positive relationship(r = 0.98) exists between claims and final construction costs, indicating that claims impact significantly on the final cost of the building projects. It was thus advanced that, there should be proper planning (and estimating)

by stakeholders, prior to building construction, in order to reduce cost overruns and restore confidence in the Nigerian construction industry.

KEYWORDS: Building construction, Building cost, Claims, Public buildings, Nigeria.

1. INTRODUCTION

Levin (1998) defines a claim as a written demand or written assertion by one of the contracting parties seeking, as a matter of right, the payment of money, the adjustment or interpretation of contract terms, payment of money, extension of time or other relief with respect to the terms of the contract. Claim in construction can also be described as measurement, rules, delay, disruption or any other matters not agreed between the contractors and the consultant at any given time and one party or the other wishes to raise it either for financial recompense or for a release from the liability for liquated and ascertained damages or even unliquidated damages.

Claims and change orders have been linked with cost overruns (Seeley, 1984; McCaffer, 2001), mismanaged jobs, legal entitlement and alleged spurious practice on the part of some contractors. Claims and change orders are the administrative processes required to handle construction events that take place where the contract leaves off, changed conditions, design changes, detective specification, variations, delay, disruptions, and acceleration and the successful resolution of the resulting disputes produced by these events (Bubshait and Manzaera, 1990).

Admittedly, claims and change orders suggest to most laymen and owners a costly, non-productive aspect of the construction process. This is a misconception as claims and change order are an integral part of the construction process and good claims administration principle are as important as a good engineering, safety and business principles. By virtue of their complexity and magnitude the execution and performance of building contracts frequently give rise to contractual claim against the employer (or client) by the contractor or on the other hand release from the liability for liquidated and ascertained damages or even unliquidated damages.

In the 1990-1995 recessions, contract prices were high that even relatively minor changes to project frequently gave rise to the submission of claims which often caused substantial increase in the final cost of projects. Sempel (1994) surveyed 24 construction projects in

Western Canada and found that half of the claims were the additional cost of at least 30% of the original contract value. It is generally believed that a project completed at a sum higher than the original contract sum is an inflated contract. Giwa (1988) stated that most projects are completed at a sum higher than their original contract sum. In most building projects, there is always a difference between the tender sum and final contract sum, the difference been caused by variations, fluctuations, additional works and compensations, having considerable effect on construction cost. Most contractor erroneously believe that they can go for claims when they do not make a pile of profit from a particular contract even when there is no substantial evidence to prove the claims. In order words they see claims as a last resort or last chance to bail out a losing job even when there is no documentation.

Construction claims always involve the setting up of arbitration panels, which are paid for, the period of resolving the claim. Claims are also usually resolved in the law court whereby the services of lawyers are engaged to stand for the client and the contractor. This has always been a source of extra expenses to both the employer and the contractor. At times the amount spent on claims procurement is more than the amount of financial claims. Construction claims involve records, interpretation of contract clauses. These take a lot of time that would have been used for the continuation and completion of the contract especially when the claim is due to delay. In most construction claims however, the contract is always delayed due to financial incapacitation of the employer or client (Khanchitrorakul, 2000).

The foregoing raises some pertinent questions; to what extent do claims impact on final cost of building projects? What proportion do these claims occupy in the final construction cost? Is there any relationship between claims and the final project costs? Answers to these questions form the crux of the study. It is against this backdrop that the study analyzed the impact of claims on the final cost of public building projects in Nigeria. Claim related issues such as the basis, classifications, sources, causes and preparation and presentation were also reviewed.

This study is thus aimed at analyzing the impact of claims on the final cost of public building projects in Nigeria. The following objectives were the premise for actualizing this aim:

1. To ascertain the percentage contribution of claims in the final cost of public building projects.
2. To identify the most common type of claims experienced and their cost implications.

3. To determine the relationship between cost of claims and final cost of public building projects

1.2 The basis for Claims

The reasons for Claims are many, but they fall mainly under the following:

a) Design and/or specification alteration, additional and omission, usually referred to as variations.
b) Changes in the pricing basis usually referred to as fluctuations.
c) Loss and or expenses arising from delays caused by changes in contract terms, unforeseen events or from a breach of the contract terms by one of the parties.

Most contract claims are made by the contractor against the employer. There may however also be a claim by employer against the contractor, by the contractor, against subcontractors and suppliers or vice versa or by one of the contract/sub-contractors parties against any of the professional consultants. Claims often result in original budget being exceeded. According to Hugdes and Barber (1992) there are two sets of claims; justified and unjustified.

Justified claim is one properly made under the term of the contract or which does not justify criteria for a common law claim. There is nothing wrong with a justified claim since most standard forms of contract specifically entitle the contract to apply for reimbursement of direct loss and/or expenses which he incurs as a result of certain matter specified in the contract all of which are within the direct control of the employer or of those he must bear responsibility in law. On the other hand, unjustified claims or those that are engineered at the onset of the project or during the tendering process which can cause a grade deal of trouble in the industry. They give rise to the common and unfortunately not always misconceived view that some contractors that embark on a contract with the intention of creating conflict. It is probably not too wrong to categorize such claims as fraudulent and the construction industry is perhaps the only one where such practices would be tolerated and treated as the norm.

1.3 Classification of Claims

There are various ways of classifying construction claim. They can be grouped into three. The first group classification of claim is into basic types by the objectives of claims. They consist of;

a) Claim for extra time to complete the contract
b) Claim for extra money arising out of the contract

The second classification is by considering their legal bases. Chappeli, Powell-Smith and Sime, 2005) classifies claims into the followings.

a) Contractual claims
b) Extra-contractual claims
c) Ex-gratia claim
d) Quantum merit claims
e) Negative claims
f) Positive claims

1.4 Sources of Claims

According to Kebathi (2004), claims could stem from planning and design phase and is grouped into

a) Contract documentation
b) Principle of quantum merit
c) A claim of ex-gratia payment

1.5 The Post Contract Stage

Most claims arise during the post contract stage-most claims arise from issue of variation, extension of time among others. Another common issue causing claims at the post contact stage of the project is the failure of any of the construction participants to meet a deadline. In this case we have:

a) Architect instruction
b) Delays in payment of interim certificate
c) Fluctuation
d) Retention sum
e) Claims for extension of time
f) Payment for liquidated and ascertained damages

1.6 Causes of Claims

Levin (1998) gave the following as the causes of claims in the construction industry

a) Human frailty
b) Conductive of contract (JCT)
c) Variations
d) Legislature

1.7 Claim Preparation and Presentation

Most people agree that a properly prepared claim which is well presented helps to resolve the dispute. Claims should be formerly presented and they should be persuasive, objective and positive. They should avoid verbosity, repetition and emotive statements. The preparation of claims begins as you start on site with the setting up of the efficient record keeping system. For any claims to succeed, it must be based on factual records (Alkas and Harns, 1991). The claim will need to draw on all the project files and documents. All claims should also follow a logical order and should move almost automatically from one section to the next. According to Levin (1998), the following are suggested as logical steps for making a valid claim:

a) Establish contact particulars
b) Establish extension of time
c) Record all the matters affecting the contract
d) Establish contractual grounds
e) Evaluate the claim

Levin (1998) further submitted that to maximize the chances of adequate and profitable recovery in claims and change order, it is important that the contractor have sound, systematic policies and procedures for the administration of all claims and change orders. The basic procedure for claims and change order administration are

a) Contract knowledge
b) Notification
c) Systematic and accurate documentation
d) Analysis of time and cost impact
e) Dispute resolution and price negotiation
f) Pricing
g) Negotiations

Proper claim management begins with identification of claims. The contractor must be able to identify a claim situation when it first develops, not after it has become a controversy. Identification goes hand-in-hand with notification. Most public and private contracts clauses requiring notification of differing site conditions, changes and delay within a stated period of time before equitable and adjustment can be pursued. Basic procedures for claims thus,

involves: identification of claims, notification of claims and finally, documentation of the claims

1.8 Areas where Claims cannot be made

Undoubtedly, construction is complicated; involving hazards and risk not always encountered in other industries. Therefore, it is essential that contractual requirements are fully understood before signing a contract and that every possible financial avenue of recompense is established, since filing claims afterwards cannot resolve financial difficulties. Kebathi (2004) stressed the following are scenarios where claims cannot be made:

a) Wrong tender
b) Low or uneconomic rate
c) Inadequate understanding of the complexities of the project
d) Poor administration and site condition
e) Plant not properly utilized
f) Failure to obtain all variation orders
g) Failure to obtain all day works
h) Failure to register claims
i) Failure to submit all price fluctuation
j) Attempt to perform operations in the unfavourable seasons e.g. excavation in very wet periods.
k) Inefficient programming critical path analysis and failure to update the programme realistically and expedite the works efficiently throughout the the contract
l) Lack of professional skills such as site management, quantity surveying, forecasting, specialist, engineering, work study and critical path programming
m) Poor servicing of plant and equipment, hence lower output
n) Idle time of men and plant awaiting drawings and instructions or use
o) Poor incentive or bonus scheme
p) Late delivery of materials incurring idle time of labour and plant due to bad ordering
q) Incorrect forecasting of contract period

2. METHODOLOGY

Ten completed public building projects, randomly selected from two States, Delta and Anambra State (i.e. five projects from each State) were surveyed and cost data/ information

obtained. The data collected was analyzed using simple percentage and Pearson- correlation co-efficient statistics. The results were presented in tables for proper elucidation.

2.1 Correlation Analysis

When the value of one variable is related to another, they are said to be correlated. Thus correlation simply means an inter-relationship or association (Lucey, 2002). Correlation, according to Eze et al. (2005) measures the extent of relationship between two or more variables. Correlation can therefore be regarded as a form of statistical analysis or test used to measure the degree of relationship between two or more different sets of data, one independent(X) and the other dependent (Y).For instance, the value of 'X' determines the value of 'Y'. The variables in the study are the claims cost (independent variables) and the final project cost average (dependent variable). The variable that depends on the other is the dependent variable while the variable on which it depends on is the independent variable.

Variables may be perfectly correlated, partly or partially correlated or uncorrelated. A positive correlation occurs when movements in one variable results in movement in another variable in the same direction. A negative correlation occurs when movement in one variable results in movement in another variable in the opposite direction.

The degree of relationship between two sets of variables is called the correlation coefficient (r). The value of the correlation coefficient does not however provide evidence of any underlying causal factors. It is measured either by using the Pearson Product Moment correlation coefficient (r) or the Spearman Rank correlation coefficient (Rho). The Pearson Product Moment Correlation Coefficient is the most popular method of providing the value of 'r'. It is used when there are two sets of data and you want to determine whether there is a strong relationship between them.

The strength of the relationship is measured on a scale that varies from +1 through-1, i.e. The Pearson correlation coefficient (γ)'s value ranges from -1 to +1 (that is $-1 \leq \gamma \leq +1$). The closer γ is to +1 or -1, the more closely the variables are related as follows: $\gamma = +1$ indicates a perfect positive relationship exists between the variables, $\gamma = -1$ indicates a perfect negative relationship, $\gamma < +0.5$ indicates a weak positive relationship, $\gamma \geq +0.5$ indicates a strong positive relationship, $\gamma < -0.5$ indicates a strong negative relationship, $\gamma \geq -0.5$ indicates a weak negative relationship and $\gamma = 0$ indicates that no linear relationship exists between the variables. It can be calculated by the formula:

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{n\sum x^2 - (\sum x)^2 (n\sum y^2) - (\sum y)^2]}} \quad (1)$$

Where:

r = Pearson correlation co-efficient

x = The dependent variable

y = The independent variable

n = number of data/observations

In order for the scores of both variables to be highly correlated, the calculated value of r has to be ≥critical value of r given in the table.

3. DATA PRESENTATION

Table 1 shows the contract sums and claims made on the surveyed public building projects.

Table 1. Cost Data/Project Information on Surveyed Public Buildings

S/N	Nature of Project	Commencement period	Completion period	Initial Contract sum (₦)	Final contract cost(₦)	Claims (₦)
1	Construction of Administrative block for school of Engineering.	2006	2009	114,407,137.89	152,699,096.89	Fluctuation 38,231,939.00
2	Construction of a Mini-sports arena	2007	2009	94,178,027.17	125,485,353.48	Variation 21,669,075.95 Fluctuation 9,638,250.36
3	32-Units 2 bedroom bungalow	2008	2010	70,600,000.00	103,600,000.00	Fluctuation 33,000,000.00
4	One storey male hostel (25 rooms)	2009	2010	49,956,315.79	71,806,000.00	Variation 16,387,263.17 Fluctuation 5,462,421.05
5	Construction of classroom blocks	2009	2010	32,650,000.00	34,594,937.00	Fluctuation 1,944,950.16
6	Mini-stadium	2006	2011	213,000,000.00	377,900,000.00	Variation 160,000,000.00
7	Pharmacology building	2009	2011	123,000,000.00	140,000,000.00	Variation 17,000,000.00

8	Stock exchange market	2006	2010	14,000,000.00	144,000,000.00	Variation 30,000,000.00
9	Construction of Mini-stadium	2006	2011	108,000,000.00	147,000,000.00	Variation 27,800,000.00 Fluctuation 11,200,000.00
10	Local Government Secretariat	2003	2010	74,000,000.00	106,000,000.00	Variation 32,000,000.00

Source: Authors' field Survey (2015).

4. RESULTS AND DISCUSSION

4.1 Percentage contribution of claims to the final cost of public building projects.

Table 2. Cost data/project information on surveyed public buildings

Project No	Final contract cost(₦)	Claims cost(₦)	Percentage contribution
1	152,699,096.89	38,231,939.00	25.03
2	125,485,353.48	31,307,326.31	24.94
3	103,600,000.00	33,000,000.00	31.85
4	71,806,000.00	21,849,684.22	30.42
5	34,594,937.00	1,944,950.16	5.62
6	377,900,000.00	160,000,000.00	42.34
7	140,000,000.00	17,000,000.00	12.14
8	144,000,000.00	30,000,000.00	20.83
9	147,000,000.00	39,000,000.00	26.53
10	106,000,000.00	32,000,000.00	30.18

It can be observed from table 2, that percentage contribution of claims to final contract sum on most public building projects surveyed were above twenty percent, which is quite a considerable amount. On the average, percentage contribution to final cost is 24.99, approximately 25%. This goes to show that claims contribute about a quarter to the increases in project costs in the study areas.

4.2 The most common claims experienced and their cost implications.

Table 3. Frequency of occurrences and cost implications of type of claims in the projects surveyed

Claim type	Frequency of occurrence	Percentage occurrence	Total cost implication(₦)
Variation claims	7	53.84	304,856,339.10
Fluctuation claims	6	46.15	99,477,560.57

From table 3, it can be deduced that variation claims occur more frequently (53.84%) in public building projects than fluctuation claims. This clearly indicates that design and/or

specification alterations/modifications, increased scope of work or additional works and omissions are more rampant in the building industry. Cost implications of such variations claims for the surveyed projects amounts to three hundred and four million, eight hundred and fifty six thousand, three hundred and thirty nine naira, ten kobo (₦304,856,339.10), which is quite a considerable sum and obviously a huge drain on the government's purse. This could have been avoided if proper planning was done at the pre-construction stages. On the other hand, fluctuation claims with a percentage frequency of 46.15 cannot be ignored because the difference both types of claims is small. This shows that increases in prices of construction resources (materials, labour, plant and equipment) in Nigeria are also common place. Thus, the inflationary trend in the country should be a cause for concern for stakeholders. Prices of commodities in Nigeria tend to go up only, and never come down, and such price increases changes the basis for pricing, thereby increasing final construction cost significantly. This is as depicted by the total sum of nine hundred and ninety nine million, four hundred and seventy seven thousand, five hundred and sixty naira (N99,477,560.57)for the projects surveyed.

4.3 The relationship between final construction cost and claims of public building projects

Table 4. Computation of the relationship between final construction cost and claims cost

S/N	x	y	x^2	y^2	xy
1	15.26	3.80	232.87	14.44	57.99
2	12.54	3.13	157.25	9.80	39.25
3	10.36	3.30	107.33	10.89	34.19
4	7.18	2.18	51.55	4.75	15.65
5	3.45	0.19	11.90	0.04	0.66
6	37.79	16.00	1,428.08	256	604.64
7	14.00	1.70	196.00	2.89	23.80
8	14.40	3.00	207.36	9.00	43.20
9	14.70	3.90	216.09	15.21	57.33
10	10.60	3.20	112.36	10.24	33.92
	$\sum x = 140.28$	$\sum y = 40.40$	$\sum x^2 = 2720.79$	$\sum y^2 = 333.26$	$\sum Xy = 910.63$
	r = 0.98				

Applying the Pearson co-efficient correlation formula;

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{n\sum x^2 - (\sum x)^2 (n\sum y^2) - (\sum y)^2]}}$$

Where: r = Pearson correlation co-efficient, x = final construction cost, **y** = cost of claims and **n** (number of projects) = 10.

When the correlation co-efficient of the amount of claim and the final construction cost on the projects was computed, as depicted in table 4, an "r" value of 0.98 was obtained, which shows that there exist a strong positive correlation or relationship between the amount of claims and final construction cost of the projects surveyed. It can thus be inferred that there is a significant relationship exists between claims and final construction cost of public buildings.

5. SUMMARY, CONCLUSION AND RECOMMENDATIONS

The study showed that about 25% increase in costs of the surveyed public building projects are attributable to claims and the most frequent type of claims experienced on these projects are variation claims. A strong positive relationship also exists between claims and final construction costs, indicating that these claims impact significantly on the final cost of the building projects.

Claims in the Nigerian construction industry can be said to be welcomed by contractors, but dreaded by clients. This is because claims when positive and well prepared normally lead to increase in construction cost which is often borne by the clients and enjoyed by the contractors. Claims in the Nigerian construction industry should thus be avoided in order to reduce cost and time overruns. This will only be possible if the stakeholders in the construction industry play their role effectively and efficiently during the design and construction stages of project execution.

In view of this, the following corrective propositions are hereby advanced:

- Much focus should be placed on the factors causing construction claims in order to reduce the cost of construction projects and generate confidence within the construction industry.
- There should be thorough cross-check of estimates based on up-dated price information in order to avoid wrong estimates.
- Client should clearly identify their requirement and need and check whether they are able to achieve them, given their financial capability in order to reduce payment problem.
- Designers must be allowed sufficient time to produce detail design (working drawing) before tendering. This will give room for incorporation of buildability, site conditions and complexity of project. Designers must also be fully aware of the site conditions and building regulations when designing.

- Contractors should spare no effort in following the correct procedure, and should prepare claims as soon as they arise not leaving them until the time of preparing final account for the project.
- Clients, contractors and consultants should have an economic approach to construction work such that they would be able to identify the dominating factors leading to the high cost of construction and apply the proffered solution to minimize same, restore client confidence in contract, reduce investment risk and generally boost the viability and sustainability of the industry.

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REFERENCES

1. Alkas S and Harns F "Export System Contractors Claims Analysis - An integrated System Approach", Building Research and Information., 1991; 19(1): 60-63.
2. Bubshait K and Manzaera I "Claim Management", Project Management Journal., 1990; 8(4): 223-226.
3. Chappeli D, Powell-Smith V and Sime J (2005), Building Contract Claims, 4th Edition, Blackwell Publishing.
4. Eze J I, Obiegbu M E and Jude-Eze EN (2005), Statistics and Quantitative Methods for Construction and Business Managers, Nigerian Institute of Building.
5. Giwa S L "Difference between Initial and Final Contract sum on Construction Projects in Nigeria", Paper presented at the Seminar of the Nigerian Institute of Quantity Surveyors., 1988; 24-25.
6. Hudges G A and Barber J N (1992), Building and Civil Engineering Claims Introspective, Longman Scientific and Technical.
7. Kebathi S "Evaluation of Claims in the Building Industry", Paper presented at a Seminar of the Chartered Institute of Arbitrators, Kenya branch., 2004; 13–16.

8. Khanchitrorakul S (2000), "Development of Construction Claims Supporting System", (Unpublished Master Thesis), Department of Civil Engineering, King Mongkut University of Technology Thonburi (KMUTT), Bangkok.
9. Levin P (1998), Construction Contract Claims- Changes and Dispute Resolution, 2nd Edition, ASCE Press.
10. Lucey T (2002), Quantitative Techniques, MPG Books Ltd.
11. McCaffer R (2001), Modern Construction Management, 5th Edition, Blackwell science.
12. Seeley I H (1984), Quantity Surveying Practice, Macmillan
13. Sempel "Construction Claims, Dispute causes and Cost/Time overruns", ASCE Journal of Construction Engineering and Management., 1994; 120(4): 785-786.