

RISK ASSESSMENT AND ESTIMATING IN BUILDING CONTRACTS IN NIGERIA

¹Kehinde Olukanyin Akinsanya and ²Falilat Olubunmi Idowu
Quantity Surveying Department, School of Environmental Studies
Yaba College of Technology, Yaba, Lagos, Nigeria
E-mails: ¹kakinpelu@yahoo.com / ²mrsidowu2000@yahoo.com

Abstract: This study studies risk assessment and estimating in building contracts in Nigeria, which is a factor perceived to be crucial in performance in building contracts. The study indicates that building construction participants in Nigeria perceived risk as uncertainty which is most crucial to performance of building contracts in Nigeria and that there are significant differences in the perceptions of contracting organizations in Nigeria. Relevant literatures were reviewed on risk management assessment. The Population considered was the building organizations in Lagos, they were both interviewed through a semi-structured questionnaire to obtain information on risk assessment and estimating in building contracts while and questionnaire distributed to construction participants within Lagos. Data collected were analysed through the use of ranking method. The result shows that inadequate program schedule, inaccurate cost estimation and insufficient site information are major risk factors. The study recommended that sufficient information on the project should be supplied for production accurate and consistence cost estimation.

Keywords: risk, risk assessment, risk estimation, contracts and building contracts.

1.0 INTRODUCTION

Risk has been defined in various ways. Risk can be expressed as an exposure to economic loss or gain arising from involvement in the construction process. Some researchers describe risk in relation to construction. Everybody is exposed to risk daily, and property construction companies are no exception. This study investigates risk assessment and estimating in building contracts in Nigeria, the factors perceived to be crucial in performance in construction contracts. Relevant literatures are being reviewed and questionnaire distributed to construction companies within Lagos. The study indicates that construction companies in Nigeria perceived Act of God as the risk most crucial to performance of construction companies in Nigeria and that there are significant differences in the perceptions of contracting organizations based in the country. In counties such as United States of America,

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United Kingdom and Canada, risk management has become universal management process involving quality of thought, quality of process and quality of action (Sesel, 2003). In Nigeria, however, the adoption of the risk management concept has been largely part of the banking and financial sectors of the economy arising from responses to crisis that evolved within the financial sector of the economy in the early 1990s.

The outcomes of project are, however, uncertain and there are many parameters and variable over which a company has little or in control (Herman, Getz and Michael, 2003). Odeyinka (2006) also defined risk in construction as a variable in the construction process whose variation results in uncertainty as the final cost, duration, and quality of the project. In the lights of this definition, he views risk as a psychological phenomenon that is meaningful in terms of human reactions and experiences and as an objective phenomenon that may or may not occur. The successful completion of any project is most times assessed on the basis of three parameters, which constitute risk: Time, Cost and Quality performance (Nworuh and Nwachukwu, 2004).

According to Zou et al, (2007), risk management may be described as “a systematic way of looking areas of risk and consciously determining how each should be treated. The strategies to manage risk include transferring the risk to another party, avoiding the risk, reducing the negative effects on probability of the risk, or even accepting some or all of the consequences of a particular risk. Failure to adequately deal with uncertain, unpredictable and undesirable events has been shown to cause serious effects of risk that can be summarized as.

- Failure to keep within cost estimate
- Failure to achieve the required completion date
- Failure to achieve the required quality and operational requirements
- Risk perception by the construction industry requirements
- Organization of risk management
- Management of risk
- Risk premium in construction projects
- Current usage of risk management techniques

2.0 CONTRACT

A contract is a legal agreement between two or more people for an exchange of goods or services. Contracts are enforceable by contract law. There are many different types of contracts and they vary between industry and according to the type of serviced performed. The basis of remuneration, the time scale, and the penalties, if any, (for

failure to comply with terms of the contract) is termed as a building or construction contract.

2.1 CONTRACT DOCUMENTS

The contract documents are all documents which, when combined, forms the basis of the contract. It is recommended that both parties to the contract execute or endorse complete sets of all contract documents and these should be preserved intact. A possible lists of documents that makeup the contract documents include:

- The Contract or Agreement
- Conditions of the Contract
- Special conditions of Contract
- Specifications
- Bill of quantities
- Architectural drawings
- Electrical and Mechanical Engineering drawings
- Structural drawings

2.2 TYPES OF CONTRACTS

Traditional procurement is of three main types of contracts as described below;

- Lump sum contracts – where the contract sum is determined before construction work is started. The contractor undertakes a defined amount of work in return for an agreed sum. Contracts ‘with quantities’ are priced on the basis of drawings and a firm bill of quantities. Contracts ‘without quantities’ are priced on the basis of drawings and another document — usually a specification or work schedules.
- Measurement contracts – where the contract sum is not finalised until after completion, but is assessed on remeasurement to a previously agreed basis. This type of contract can arise because the work which the contractor undertakes cannot for good reason be measured accurately before tenders are invited. Design will be reasonably complete and an accurate picture of the quality required will be available to the tenderer. Probably the contract of this type with least risk to the client is that based on drawings and approximate quantities.
- Cost reimbursement contracts – where the sum is arrived at on the basis of prime (actual) costs of labour, plant and materials, to which there is added an amount to cover overheads and profit. Sometimes referred to as a ‘cost-plus’ or a ‘prime cost’ contract; the amount or fee added to cover overheads and profit can be a fixed sum, a percentage, or on some other reimbursement basis.

2. 2.1 DESIGN AND BUILD

According to Pasquire C. and Collins S. (1997), design and build procurement is further divided into three main types of contract:

- Package deal or turnkey contract –where the client settles on a complete package, usually to some standard specification from a commercial firm. Such arrangements sometimes result in a specially drafted contract, but they will usually be based on the provider’s standard terms.
- Design and build contracts – where project documents will be written with the contractor’s design obligations relating to the whole of the works in mind. These contracts differ fundamentally from traditional ‘work and materials’ contracts in that they expressly provide for contractor’s design obligations. The wording used in contracts which require a material level of design input from the contractor is often the same as in those which are used for a ‘develop and construct’ approach.
- Contractor’s design for specific elements only, these are not design and build contracts, but traditional ‘work and materials’ contracts which include for limited design provision relating to an identified portion of the work.

2.2.2 MANAGEMENT CONTRACT

According to Pasquire C. and Collins S. (1997), management procurement is divided into two main types of contract, but variants do exist:

- Management contracts – where the management contractor undertakes to manage the carrying out of the work through works contractors, who are contractually accountable to him. The contract will usually include both a pre-construction phase and the construction phase. The management contractor is responsible for the administration and operation of the works contractors. However, the management contractor is not liable for the consequences of any default by a works contractor so long as the management contractor has complied with the particular requirements of the management contract. Obviously the management contract and the works contracts for each package must be compatible.
- Construction Management – where the construction manager undertakes to manage the carrying out of the work through trade contractors but the client is involved in the directing of the project, and the contracts with the trade contractors are directly with him. The construction management appointment will be for the services as defined in that document. Although the trades’ contracts are arranged and administered by the construction manager,

contractually they are the client's risk. Obviously the construction management appointment and the trade contract for each package must be compatible.

- Design – manage – construct

This and other variants of management procurement exist but such contracts are invariably on the basis of specially drafted forms to suit the particular situations.

2.3 RISK MANAGEMENT

Risk management is central part of any organizations' strategic management. It is the process whereby organizations methodically address the risks attaching to their activities with the goal of achieving sustained benefit within each activity and across the portfolio of all activities. The focus of good risk management is the assessment and estimating of these risks. Its objective is to add maximum sustainable value to all the activities of the organization. It must translate the strategy into tactical and operational objectives, assigning responsibility throughout the organization with each manager and employee responsible for the management of risk as part of their job description. It supports accountability, performance, measurement and reward thus, preparing operational efficiency at all level. Risk management is a straight forward process in that it requires the evaluation of risk and the execution of risk management strategy (Ashworth et al, 2002). Flanagan and Norman (2003) gave the sequence declining with risk.

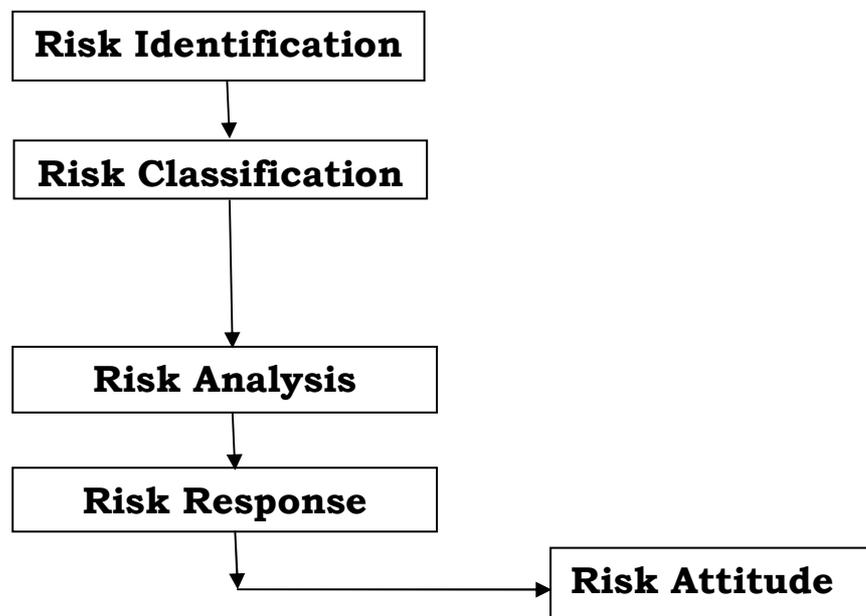


Figure 2.1: Risk management system/process

Source: Adapted from Risk management and Construction by Flanagan, R, and Norman, G. (1999) Pg.16.

2.3.1 RISK ASSESSMENT AND ANALYSIS

Risk identification sets out to identify an organizations'; exposure to uncertainty. Risk assessment is defined as the overall process of risk analysis and risk evaluation.

This requires an intimate knowledge at the organization, the market in which it operates, the legal, social, political and cultural environment in which it exists, as well as the development of a sound understand or its strategic and operational objectives, including factors critical to its success and the threats and opportunities related to the achievement of these objectives. Business activities and decisions can be classified in a range of ways; examples of which include.

2.3.2 RISK DESCRIPTION

The objective of risk description is to display the identified risks in a structured format, for example by using a table. The risk description table overleaf can be used to facilitate the description and assessment of risks. The use of a well designed structure is necessary to ensure a comprehensive risk identification, description and assessment process..

Table 1. Risk – Description

1	Risk Description	
2	Name of Risk	Qualitative description of the events, their size, type, number of dependencies
3	Nature of Risk	E.G strategic, operational, Financial, knowledge or compliance
4	Stakeholders	Stakeholders and their expectation
5	Quantification of risk	Significance and Portability
6	Risk Tolerance / Appetite	Loss potential and financial impact or risk Value at risk Profitability and size of potential losses/ gains Objective(s) for control of the risk and desired level of performance
7	Risk Treatment & Control Mechanisms	Primary means by which the risk is currently managed levels of confidence in existing control Identification of protocols for monitoring and review
8.	Potential, Action for Improvement	Decommissions to reduce risk
9	Strategy and Policy Development	Identification of function responsible for developing strategy and policy

2.3.3 RISK ESTIMATION

Risk estimation can be quantitative, semi-quantitative or qualitative in terms of the probability of occurrence and the possible consequences. For example consequences both in terms of threats (downside risk) and opportunities (upside risk) may be high, medium or low. Probability may be high, medium or low but requires different definitions in respect of threats and opportunities. Other organizations find that assessing consequences and probability using a 5 x 5 matrix gives them a better evaluation.

2.3.5 RISK ANALYSIS METHODS AND TECHNIQUES

A range of technique can be used to analyze risk. There can be specific to upside or downside risk or be capable of dealing with both.

2.3.6 RISK PROFILE

The result of the risk analyst's process can be used to produce a risk profile which gives a significant rating to each risk and provides a tool for prioritizing risk treatment efforts. This ranks each identified risk so as to give a view of the relative importance.

2.3.7 RISK EVALUATION

When the risk analysis process has been completed, it is necessary to compare the estimated risks against risk criteria which the organization has established. The risk criteria a may include associated and benefits, legal requirements, socio-economic and environmental factors concerns of stakeholders etc. risk evaluation therefore, is used to make decisions about the significance of risks to the organization and whether each specific risk should be accepted or treated.

2.4 MONITORING AND REVIEW OF THE RISK MANAGEMENT PROCESS

Effective risk management requires a reporting and review structures to ensure that risks and effective identified and assessed and that appropriate controls and responses are in place. Regular audits of policy and standards compliance should be carried out and standards performance reviewed to identify opportunities of improvement. It should be remembered that organizations are dynamic and operate in dynamic environment. Changes in the organization and the environment in which it operates must be identified and appropriate modifications made to systems. The monitoring process should provide assurance that there are appropriate controls in place for the organization's activities and that the procedures are understood and followed.

Royer (2000) sees risk management as:

- deciding what is an acceptable risk

- how the level of the risk can be brought down to a level that is capable
- Monitoring the reduction in risk after exposure control actions has been taken.

However, Royer also points out that having such a focus of risk on adversity means project risk management tends to focus more on processes and methods that reduce the effect of threats.

2.5 THE NATURE OF RISK

According to Del Cano and de la Crux, (2002), while risk is fairly well documented in the literature, the terminology is not consistently applied across construction, project management, engineering, health and safety, environment, business and other industries. Risk can be classified as voluntary or involuntary, depending on whether or not the events leading to the risk are under the control of the persons at risk or not in the theoretical sense.

2.6 RISK AND UNCERTAINTY

Decisions are concerned with variables which are normally classified as risks or uncertainties. Risks are unknowns, the probability of the occurrence of which can be assessed by statistical means (risks are usually insurable). Del Cano and de la Cruz, 2002, as knowledge increases in conjunction with the amount and detail of statistical data, areas-of uncertainty are progressively converted to areas of risk. Risk links strongly with the uncertainty of the probability and consequence of a risk event.

2.7 IMPORTANCE OF RISK ANALYSIS

- More objectivity is in its assessments.
- More powerful selling tool to manage.
- Offers direct projection of cost /benefits of proposals.
- Can be fine-tuned to meet the needs of specific situation.
- Can be modified to fit the needs of specific industries.
- Much less prone to arouse disagreement during management reviews.
- Analysis is often derived from some irrefutable facts.

2.8 RISK ASSESSMENT

Risk assessment provides qualitative and quantitative data to decision makers for later use in risk management and when project risk assessment is undertaken properly and implemented correctly, and in sequence.

2.8.1 RISK ASSESSMENT MODELS

A number of systematic models have been proposed for use in the risk-evaluation phase of the risk-management process.

2.8.2 QUALITATIVE RISK ASSESSMENT

The term qualitative is described as: Relating to, or involving quality or kind. It offers a more technical definition in the context of program evaluation by describing qualitative data as consisting of detailed descriptions of situations, events, people, interactions, and observed behavior: direct quotations from people about their experiences, attitudes, beliefs, and thoughts; and excerpts or entire passages from documents, correspondence, records, and case histories.

2.8.3 QUANTITATIVE RISK ASSESSMENT

Quantitative risk assessment relies on statistical methods and this quantitative approach is difficult to document because it relies on quality data. According to Del Cano and De la Cruz, 2002, each project is unique and what data exists is based on past projects that may contain significant uncertainty when applied to current projects construction simulation, fault tree analysis, fuzzy stochastic applications, risk premium and expected net present value are just a few of the many quantitative risk assessment techniques that can be used. These are explained in detail in the following paragraphs.

2.9 PROJECT SITE CONDITION RISKS

According to Queensland Department on Main Roads, 2000, a major risk in any civil engineering project is that the construction may encounter physical obstructions or conditions on the project site which were unexpected and unforeseeable at the time of making the decision to build the project and which may delay work or cause increased costs.

2.10 RISK DISTRIBUTION IN PROJECT PROCUREMENT

Wang and Chou (2003) assert that risk management needs to be made more efficient and effective so all parties can understand:

- Their respective responsibilities
- Risk event conditions
- Risk preferences
- Risk management capabilities.

They also point out that if a project contractor has different perceptions of risk allocation to those of the client or even a lack of clear understanding of risk management, then the

contractor will inappropriately manage the risks in construction projects by assuming that the risk events or consequences are not the contractor's responsibilities.

3.0 RESEARCH METHODOLOGY

The research study adopted the review of relevant literature and field survey as its method of study. The solution to the research problem was carried out through the field survey, which involves collection of all necessary information data by the administration of questionnaire to construction professionals such as architects, quantity surveyors, cost estimators, engineers, personal observations and analysis of the findings. However, for obvious time and costs constraints, the survey population was limited to Lagos State as it remains the commercial capital of the country where most construction companies are sited. The sampling technique adopted for this study is the random sampling because all the element of the population is capable of given answers to the required information. The field study was carried out using structure questionnaire. The data as collected were analyzed in order to arrive at the aim of the study. The statistical method adopted involved the use of cumulative frequency and percentage computation. The percentage computation is based on the total number of responses.

4.0 DATA PRESENTATION AND ANALYSIS

The following factors are tools for risk assessment techniques in building contracts in Nigeria. How significant are these factors used in building contract in Nigeria? From the below information under Table 4.1.0 in ascending order shows that case study has the highest ranking factor in risk assessment in building contracts in Nigeria.

Table 4.1.0 Tools for Risk Assessment in Building Contracts

Tools	No of Respondents	Mean	Rank
Brainstorming	40	3.4750	5
Expert Interview	40	3.4750	5
Research, Survey, Questionnaire	40	3.4750	5
SWOT Analysis	40	3.5500	4
Historical Data	40	3.5500	3
Checklists	40	3.5750	2
Case Study	40	3.6750	1
Total	40		

Source: field survey 2014

The following factors are risk estimating techniques in building contracts in Nigeria. How significant are these factors to construction contract? From the below information under Table 4.2.0 in descending order shows that inadequate program scheduling has the highest ranking factor in risk estimating in building contracts in Nigeria.

Table 4.2.0 Risk factors in building contract

Risk factors	No of Response	Mean	Ranking
Inadequate program scheduling	40	4.0000	1
Incomplete or inaccurate cost estimate	40	3.8250	2
Inadequate or insufficient site information	40	3.8250	2
High performance or quality expectation	40	3.7500	3
Unsuitable construction program planning	40	3.7500	3
Variations of construction programs	40	3.7250	4
Unavailability of sufficient amount of skilled labour	40	3.7250	4
Price inflation of construction materials	40	3.7250	4
Low management competency of subcontractors	40	3.7000	5
Unavailability of sufficient amount of skilled labour	40	3.6750	6
Variations of construction programs	40	3.6750	6
Design variation	40	3.6750	6
Variations by the client	40	3.6750	6
Serious noise pollution caused by construction	40	3.6750	6
Excessive approval procedures in administrative government	40	3.6500	7

departments			
Inadequate program scheduling	40	3.6500	7
Lack of coordination between projects participants	40	3.6250	8
Incomplete or inaccurate cost estimate	40	3.6250	8
Excessive approval procedures in administrative government departments	40	3.6250	8
Occurence of dispute	40	3.6000	9
Unsuitable construction project planning	40	3.6000	9
Variations by the client	40	3.6000	9
Inadequate program schedule	40	3.5750	10
Tight project schedule	40	3.5750	10
Excessive approval procedure in administrative government departments	40	3.5750	10
Low Management Competency of subcontractors	40	3.5750	10
High performance or quality expectations	40	3.5500	11
Inadequate program scheduling	40	3.5500	11
Tight Project schedule	40	3.5500	11
Design variations	40	3.5500	11
Tight project schedule	40	3.5250	12
Design variation	40	3.5250	12
Unsuitable construction program planning	40	3.5000	13
Incomplete approval and other documents	40	3.5000	13
Tight project schedule	40	3.5000	13

Variations of construction program	40	3.4500	14
Variation of construction program	40	3.4500	14
High performance or quality expectation	40	3.4500	14
Bureaucracy of government	40	3.4500	14
General safety accident occurrence	40	3.4250	15
Variations by the client	40	3.4250	15
Low management competency of subcontractors	40	3.4250	15
Incomplete approval and other documents	40	3.4250	15
Lack of coordination between project participants	40	3.4000	16
Unavailability of sufficient amount of skilled labour	40	3.4000	16
Unavailability of sufficient professionals and managers	40	3.4000	16
Tight project schedule	40	3.3750	17
Design variations	40	3.3250	18
Unsuitable construction program planning	40	3.3250	19
High performance or quality expectations	40	3.2500	20
Excessive approval procedures in administrative government departments	39	3.2308	21
Total	39		

Source: field survey 2014

5.0 CONCLUSION AND RECOMMENDATION

This research has been used to assess risk assessment and estimating in building contracts in Nigeria. In consideration of all that were studied and observed, it can be concluded that practical study carried out in this research work and from information gathered in the field

survey that Risk Assessment and Estimating in construction contracts in Nigeria depends upon the type, size and location of project, the professionals involved in the execution of the contract. Based on the above conclusion, the researcher came up with the following recommendations;

1. Brainstorming should be used for risk assessment in building contracts in Nigeria.
2. Adequate program scheduling should be ensured in order to enhance proper estimating of risk in building contracts in Nigeria.
3. Other tools can as well be used to assess and estimate risks in building contracts in Nigeria.

Further research work is suggested to be carried out on suitable tools for risk assessment and estimating in building contracts in Nigeria especially in Government and public contracts.

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