Journal of Environmental Science and Resource Management *Volume 4, June 2012*

www.cenresin.org
ISSN 2277-0097

RISKS IN BUILD, OPERATE AND TRANSFER (BOT) PROJECTS IN NIGERIA

[1]I.Y.Mohammed, [2]K. Bala and [3]S.U. Kunya
[1&3]Building Programme, School of Environmental Technology
Abubakar Tafawa Balewa University Bauchi, Nigeria
[2]Department of Building, Ahmadu Bello University, Zaria

ABSTRACT

One of the newest financial schemes for environmental projects is the Build, Operate, and Transfer (BOT) concept, which is being used increasingly worldwide as a project delivery system by which governments obtain the infrastructure projects by private sector after a concession period free of charge. In the Nigerian environment up to now, promoters and investors have had many fears toward declared projects. This study aims to investigate the potential for implementing the BOT system in the Nigerian environment. This can be achieved by giving a clear view of BOT and of its problems, risk areas, and features, pertaining to the Nigerian environment, in order to maximize the benefits and minimize the risks as much as possible. The collected data was analyzed based on actual implementation in Nigeria. This involved the following:1 An overview of the critical success factors in order to achieve a BOT project; 2 an analysis of results obtained from questionnaires seeking to determine the possibility of occurrence of the different risk factors in the Nigerian environment, and their ranking; 3 a comparison between the questionnaire results and the actual risks from requests for proposal of locally advertised projects; and 4 a determination of the missed critical success factors in the Nigerian environment. The main conclusion of this study is that three critical success factors are essential for the success of BOT projects in Nigeria: 1 Picking the right project; 2 competitive financial proposal; and 3 special features of bid.

Keywords: Nigeria; Build/operate/transfer; Risk management; Project management; Bids; Financial management.

INTRODUCTION

Serious efforts have been made to correct and refresh the Nigerian National Economy by private-sector ownership of public enterprises or by delivering new projects through the private sector. For the following reasons, the economic environment today is suitable enough for the private sector to invest in local projects (Bureau for Public Enterprises, 2000):

1. Government policy aiming to increase the private-sector participation
2. Modification in legislation and laws that encourage investments
3. Decrease in inflation rates
4. Availability of cheap and experienced workforce

In the scope of private-sector participation, the government policy intends to offer infrastructure projects such as highways, airports, and power plants to investors. The role of investors is to finance a project's "studies, design, construction and operation" through a predetermined concession period. This system of project financing and delivery is called Build, Operate, and Transfer (BOT). The BOT concept was being used increasingly by government across a number of infrastructure sectors in a drive to privatize major public

projects (Walker and Smith, 1995). The BOT system has been implemented successfully in many countries, and its importance is increasing rapidly all over the world. In Nigeria, the government has declared and made requests for proposals (RFP) for about 26 projects under the BOT system during the past two years. This reflects the importance of being aware of this new style of business, but until now the promoters and investors have had a lot of fear toward the declared projects. This is noted by the small amounts of awarded concessions in spite of the increasing need for such projects. Meanwhile, there is a lack of experience and information in dealing with such a system in the Nigerian environment, especially in the construction field. This paper aims to investigate the potential risks for implementing BOT in the Nigerian environment. Secondary objectives include an overview of the BOT system and its main features, and an analysis of BOT problems and risk areas.

Overview of BOT

What is BOT?

The term "BOT" is used mainly in the area of infrastructure projects financed by the private sector. The reasons for private sector participation in such projects are (Shalakany, 1996)

- Need of the government to get these projects
- Unwillingness of the government to finance infrastructure projects
- Unwillingness of the government to share risks in such projects
- Availability of offering finances from lending institutions and investors

"BOT" has more than one definition. Here are a few:

• Badran, (1996) explain that it is a contractual arrangement and a new legal concept to encourage private enterprises and entrepreneurs to help the government in its development effort.

• Esq. (1996) define it as a type of project financing whereby the government grants a concession to a private entity project company to build and operate a project, such as infrastructure of resource extraction that would be operated by the government.

• According to Nassar, (1996) it is a model that entails a concession company providing the finance, design, construction, operation, and maintenance of a privatized infrastructure project for a fixed period, at the end of which the project is transferred free of charge to the host government.

• "Possible" (1996) submitted that it is a model or structure that uses private investment to undertake the infrastructure development that has historically been the preserve of the public sector.

• Shalakany, (1996) defined it as the granting of a concession by the government to a private promoter, known as the concessionaire, who is responsible for the financing, construction, operation, and maintenance of a facility over the concession period before finally transferring the fully operational facility to the government at no cost.

• According to Tiong, (1995c), it is essentially, a form of project financing whereby a government awards a group of investors hereafter referred to as "Project Consortium" a concession for the development, operation, management, and commercial exploitation of a particular project.

Members of BOT Projects

Table 1 shows the different members and summary of different agreements in BOT projects ("B.O.T." 1996c).

Table 1. Different Members and Summary of Different Agreements in BOT Projects

S/Number	Parties of agreement	Agreement description
1	Host government	Concession agreement
2	Project company	Investment agreement
3	Construction contractors	Construction contract
4	Banks and lending institutions	Financing agreement
5	Equipment manufacturer	Supply agreement
6	Operator	Operating agreement
7	Developer	Power supply contractor

Advantages of BOT

The BOT approach to finance infrastructure projects has many potential advantages (Tiong 1995b):

• The use of private-sector financing to provide new sources of capital, thus reducing public borrowing and improving the host government's credit rating

• The ability to accelerate the development of projects that would otherwise have to wait for scarce sovereign resources

• The use of private-sector capital, initiative, and know-how to reduce project construction costs and schedules and to improve operating efficiency

• The allocation of project risk and burden to the private sector that would otherwise have to be undertaken by the public sector

• The involvement of private sponsors and experienced commercial lenders, providing an in-depth review and additional assurance of project feasibility

• Technology transfer, training of local personal, and development of national capital markets examples of other substantial benefits of BOT projects

• In contrast to full privatization, the government's retention of strategic control over the project, which is transferred back at the end of the contractual period.

• The opportunity to establish a private benchmark to measure the efficiency of similar public-sector projects and thereby offer opportunities for the enhancement of public management of infrastructure facilities.

Table 2. Major Problems and Risk Areas of BOT Projects

Item Number	Problems and risk areas	Description
1	Off-take arrangement	Uncertainty of total product Distribution (take or pay) agreement
2	Supply arrangement	Inability to obtain the necessary quantities of production requirements (e.g., fuel, water, raw materials)
3	Environmental laws	Additional-cost technical problems due to use of recommended technology or of method of construction
4	Force majeure	Unavoidable events interrupt the or construction operation due to • Nonpolitical events • Domestic political events • Foreign political events
5	High development costs	Time and cost-intensiveness of developing a typical BOT project

Table 3. Problems of BOT Projects Related to Their Phases

Phases	Problems
Identification	• Lack of consistency and poor governmental management
Government preparation for tender	• Unrealistic or unclear government's criteria for project award • Unclear or unapplied terms of competition in the RFP
Sponsor's preparation of a bid	• High development costs • Choice of attractive equity/debt ratio • Determination of shortest concession period
Selection	• Legal constraints in applying evaluation criteria
Development	• Problems related to project company formation • Problems of contract drafting
Implementation	• Construction risks
Operation	• Operating risks
Transfer	• Applying concerned terms in concession

Problems of BOT Projects

BOT projects may face some problems and risks; risk is in the nature of such projects. Some of these problems concern the promoters, but if it is taken into consideration that contractors and suppliers are shareholders, then the problems of BOT are also problems that face contractors, suppliers, and so on. The major problems and risk areas that may face the BOT projects are outlined in Table 2. Table 3 shows the different phases of BOT projects and their problems ("B.O.T." 1996b).

Application of BOT Projects in Different Countries

The major BOT projects in the world and their names are shown in Table 4 ("B.O.T. 1996a).

Table 4. Major BOT Projects in Different Countries

Country	Projects
Australia	F4 Toll Road
	F5 Toll Road
Sydney	Airport Link
	Sydney Water-Treatment Plants
	Loy Yong Power Plant
	Collie Power Plant
	Victoria Toll Road
Melbourne	Tolled Bypass
Canada	Northumberland Strait Crossing Bridge
	Toronto Airport Extension
Hong Kong	Eastern Harbor Crossing
	Tatc's Cairn Tunnel
	Western Harbor Crossing
Hungary	M1 Toll Road
Indonesia	Cikampck-Padatarang Tollway
Malaysia	Johor Water Supply
	North-South Highway
	Ipoh Water Supply
	KL Toll Interchanges
Philippines	Hopewell's Gas-Turbine Power Plant
	Hopewell's Coal-Fired Power Plant
	Manila Light-Rail Train
Thailand	Second-Stage Expressway
	Third-Stage Expressway
	BMA Light Rail
	Hopewell's Road Rail
	Don Muang Tollway
	Skytrain
United Kingdom	Channel Tunnel
	Dartford Bridge
	Second Scverns Bridge
	Sky Bridge
	Manchester Metro Link
	Birmingham Relief Road
United States	Caltrans Transport Projects
	Florida High-Speed Rail
	Texas High-Speed Rail
	Honolulu High-Speed Rail
	Arizona Transport Projects
	Dulles Toll Road

Application of BOT Projects in Nigeria

BOT projects in Nigeria started in the last century—e.g., the Domestic terminal of Murtala Mohammed International Airport Ikeja, Lagos, University Students hostels, Abuja Downtown

Mall, and several other states projects. These projects were operated according to concession agreements under the Nigerian Laws.

Study Methodology

The types of collected data include the following: 1; International BOT projects; 2; BOT overview; main features, problems, risk areas, and critical success factors CSFs; 3; Nigerian construction environment; financial, legal, political; and 4 proposed projects under study locally. The collected data was analyzed to determine the most likely problems of BOT based on actual implementation in Nigeria. This involved the following:

- An overview of the CSFs in order to achieve BOT projects
- An analysis of results obtained from questionnaires in order to determine the possibility of occurrence of the different risk factors in the Nigerian environment and their ranking expected risks
- A comparison between the questionnaire results and the actual risks from RFPs of locally advertised projects
- A determination of the missed CSFs in the Nigerian environment

Determining Critical Success Factors

This was conducted through studying the published papers, which reflect the past experience of the international BOT projects Table 5.

Table 5. Critical Success Factors in BOT Projects (Tiong 1995a)

Critical success factor (CSF)	Subfactors
Entrepreneurship	• Calculated risk taker • Cultivating good will and relationship with host government officials
Picking the right project	• Accurate prediction of critical need for project • Lack of funds by host government • Ideal candidate for privatization • Potential to achieve near monopolistic advantage for the products provided
Strong team of stakeholders	• Form a multidisciplinary and multinational team of stakeholders • Leadership from key entrepreneur or corporation • Financial strength for protracted negotiations
Imaginative technical solution	• Simplicity • Functional • Innovative • Cost-effective
Competitive financial proposal	• Low construction costs • Reasonably high debt-equity ratio • Acceptable tariff level

	• Short construction and concession periods
	• Forecasts of future demand
Special features of bid	• Imaginative elements that demonstrate altruism toward host government

Determining Possibility of Occurrence of Different Risk Factors

A questionnaire Table 6 was developed containing the four main types of risks in BOT projects, identified in Table 7. These types of risks are

- Political risks (8 subfactors)
- Construction risks (8 subfactors)
- Operating risks (7 subfactors)
- Market and revenue risks (4 subfactors)

The questionnaire was prepared in the following manner:

- Each type of risk was considered independently from the other types.
- For subfactors of each type of risk, the respondents were asked to assign relative weights from 0 to 100% and a ranking from 1 to *n*, where *n* is the total number of subfactors of each type of risk.
- For each type of risk, the total relative weight of its subfactors was normalized to 100%.

The questionnaire was sent to 93 different persons and entities, from which 74 responses were received, falling into the categories in Table 6.

Determination of Missed Critical Success Factors

This was conducted through ranking of the risks and what is needed (as CSFs) in order to get successfully implemented BOT projects in Nigeria.

Table 6. Questionnaire

Categories	Total number	Number of responses
Businessmen	24	19
Public authorities	12	9
Academic Staff	9	8
Banks	9	7
Economic newspapers	3	2
Top management in construction firms	36	29
Total	93	74

Table 7. Different Risk Factors in BOT Projects

Risk factors	Subfactors
Political risks	1. Termination of concession by government
	2. Increase in taxes (specific)
	3. Changes in law (specific)
	4. Changes in law (general)

	5. Adverse government action 6. Development approval 7. Payment failure by government 8. Increase in taxes (general)
Construction risks	1. Cost overrun 2. Land expropriation 3. Increases in financing 4. Variation 5. Time and quality risks 6. Default by concession company 7. Force majeure 8. Environmental damage
Operating risks	1. Termination by project company 2. Government department default 3. Project company default 4. Labor risk 5. Technology risk 6. Environmental damage 7. Force majuere event
Market and revenue risks	1. Monopoly 2. Insufficient tariff 3. Insufficient income 4. Inflation risk

Analysis of Results

The collected data was analyzed to investigate the following:

- Expected BOT risk factors based on the questionnaire results
- Actual BOT risk factors based on the study of selected projects
- BOT CSFs that are missing within the Nigerian construction environment

Expected BOT Risk Factors

The data obtained through the questionnaire forms the most likely expected risks in the Nigerian environment. The descending arrangement of the risk factors shows the relative expected importance of such factors as follows:

Political Risks

The average relative weight of BOT political risk factors reflects the most important factors, as shown below:

- Termination of concession by government =24.29%
- Increase in taxes specific = 17.33%
- Changes in law specific = 17.22%

Construction Risks

The following ranking was found from the average weights obtained from the questionnaire:

- Cost overruns = 18.44%

• Land expropriation = 7.86%
• Increases in financing costs = 14.44%
• Variations = 14.29%

Operating Risks

For operating risks, the following ranking was found from the average weights obtained from the questionnaire:
• Termination by project company = 23.86%
• Government department default = 17.78%
• Project company default = 16.89%

Market and Revenue Risks

For market and revenue risks, the following ranking was found from the average weights obtained from the questionnaire:
• Monopoly =31.25%
• Insufficient tariff = 26.11%

Actual BOT Risk Factors

The analysis of seven RFPs of locally advertised BOT projects revealed the common risk factors that are shared in these projects shown as a table in Fig. 1. The table also presents a comparison between the results obtained by questionnaire and those obtained by analysis of locally advertised BOT projects. From this table, the following can be noted:
• The most important risk factors obtained by the questionnaire are already found in the actual local BOT projects.
• In addition, some of the less important risk factors are also found in some of the studied projects.

Determination of Missed Critical Success Factors

The risk factors prevailing in the studied projects; Table 7 were analyzed in view of the CSFs Table 5 to determine what is missing in Nigeria. Most of the different risk factors have varying impacts on the CSFs. For example:
• The sub factor "Variation" in construction risks reduces the accuracy of predicting the critical need for a project, which relates to the CSF's "Picking the right project."
• The subfactors "Cost overrun" and "Increase in financing" in construction risks have a great effect on the "Lack of funds by host government," which relates to the CSF "Picking the right project."
• The sub factor "Monopoly" in market and revenue risks reduces the potential to achieve near monopolistic advantage for the products provided, which relates to the CSF's "Picking the
right project."
• Most of the political risks do not encourage enterprises with reasonably high debt/equity ratio to invest in BOT projects in Nigeria, which relates to the CSF's "Competitive financial proposal."

• The sub factor "Insufficient tariff" in market and revenue risks does not ensure an acceptable tariff level, which relates to the CSF's "Competitive financial proposal."
• The sub factors "Insufficient income" in market and revenue risks and "Time and quality risks" in construction risks increase the construction and concession periods, which relates to the CSF's "Competitive financial proposal."
• Most of the different risk factors have an impact on the CSF's "Special features of bid." These risks are reflected on overpricing of the essential services provided.

CONCLUSIONS

The most expected risk factors in the Nigerian environment found by the questionnaire survey and confirmed by projects RFPs are as follows:
• Political Risks (termination of concession by government, increase in taxes, changes in Law (specific), and changes in law (general))
• Construction Risks (cost overrun, land expropriation, increases in financing costs, variations, and time and quality risks)
• Operating Risks (termination by Project Company, government department default, and project company default)
• Market and Revenue Risks (monopoly, insufficient tariff, and insufficient income)
Of the six CSFs described in Table 5, the following three are missed in Nigeria due to the above mentioned risk factors:
1. Picking the right project
• Accurate prediction of critical need for project
• Lack of funds by host government
• Potential to achieve near monopolistic advantage for the products provided
2. Competitive financial proposal
• Reasonably high debt/equity ratio
• Acceptable tariff level
• Short construction and concession periods
3. Special features of bid
The risk factors should be minimized to ensure successful implementation of BOT projects

REFERENCES

Badran, M. (1996). "B.O.T. and the theory of administrative contracts in Egypt." *Proc., Conf. on International Contracts of B.O.T. and Their Amicable Solutions*, Vol. 1.

"B.O.T. guidelines—1: Introduction to the B.O.T. concept." (1996a).

Proc., Conf. on International Contracts of B.O.T. and Their Amicable Solutions, Vol. 1.

"B.O.T. guidelines—2: Phases of B.O.T. project."(1996b). *Proc., Conf. on International Contracts of B.O.T. and Their Amicable Solutions,* Vol. 1.

"B.O.T. Guidelines—6: Procurement issues and selection of sponsors."

(1996c). *Proc., Conf. on International Contracts of B.O.T. and Their Amicable Solutions,* Vol. 3.

Esq, L. F. (1996). "Introduction to B.O.T." *Proc., Conf. on International Contracts of B.O.T. and Their Amicable Solutions,* Vol. 1.

Nassar, G. (1996). "What is B.O.T.?" *Proc., Conf. on International Contracts of B.O.T. and Their Amicable Solutions,* Vol. 1.

Nolan, J. W. (1997). "The Arab contractors infrastructure risk." A seminar conducted within the Junior Consultant Program, Arab Contractors Company, Cairo, Egypt.

"Possible future work." (1996). *Proc., Conf. on International Contracts of B.O.T. and Their Amicable Solutions,* Vol. 1.

Shalakany, A.(1996). "The legal framework of B.O.T. project under Egyptian law." *Proc., Conf. on International Contracts of B.O.T. and Their Amicable Solutions,* Vol. 3.

Tiong, L. K. R. (1995a). "Risks and guarantees in BOT tender." *J. Manage.Eng.,* 121(2), 183–188.

Tiong, L. K. R. (1995b). "Competitive advantage of equity in B.O.T. tender." *J. Manage. Eng.,* 121(3), 282–289.

Tiong, L. K. R. (1995c). "Impact of financial package versus technical solution in B.O.T. tender." *J. Manage. Eng.,* 121(3), 304–311.

Walker, C., and Smith, A. J. (1995). *Privatized infrastructure,* Thomas Telford, London.