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# Bot Contracts: Applicability for Infrastructural Development of Technical Universities in Ghana

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## ABSTRACT

This study was conducted with the aim of exploring the applicability of Build Operate Transfer (BOT) contracts for the accelerated infrastructural development of Polytechnics into Technical Universities in Ghana. In an empirical questionnaire survey with professionals and experts in both the construction and educational sector, the respondents were invited to rate their perception on driving factors of the BOT contracts systems. An interview session to satisfy the ways of incorporating the BOT contracts within the public procurement system of Ghana was conducted. The study revealed that the major driving factors to the use of the BOT contract system are: provision of assistance to government in financing; reducing the problem of public sector budget constraints; improves public infrastructure management and maintenance; ability of private sector to raise funds for projects; and reduction in public funds tied up in capital investment. With the participation of the private investor, governments can free up some funds to develop and support other sectors of social and economic priority. Therefore, there is a need to explore this concept, using adequate policy initiatives, proper measures and support from stakeholders to improve on infrastructural development of Technical Universities in Ghana.

*Keywords:* build operate transfer (BOT) contracts, technical universities in ghana.

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## I. ABSTRACT

*This study was conducted with the aim of exploring the applicability of Build Operate Transfer (BOT) contracts for the accelerated infrastructural development of Polytechnics into Technical Universities in Ghana. In an empirical questionnaire survey with professionals and experts in both the construction and educational sector, the respondents were invited to rate their perception on driving factors of the BOT contracts systems. An interview session to satisfy the ways of incorporating the BOT contracts within the public procurement system of Ghana was conducted. The study revealed that the major driving factors to the use of the BOT contract system are: provision of assistance to government in financing; reducing the problem of public sector budget constraints; improves public infrastructure management and maintenance; ability of private sector to raise funds for projects; and reduction in public funds tied up in capital investment. With the participation of the private investor, governments can free up some funds to develop and support other sectors of social and economic priority. Therefore, there is a need to explore this concept, using adequate policy initiatives, proper measures and support from stakeholders to improve on infrastructural development of Technical Universities in Ghana.*

**Keywords:** build operate transfer (BOT) contracts, technical universities in ghana.

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## II. INTRODUCTION

In June 2016, Takoradi Technical University signed a BOOT contract agreement with Royal Systems and Services Limited, a leading Ghanaian civil engineering company to construct a 3000-bed hostel village for the students of the Faculties of Engineering and Applied Sciences, after a daunting task of investor-search (The Herald, 2017). Although the concept of Build Operate Transfer (BOT) contracts provides benefits such as reduction in public sector administrative cost, risks sharing between parties, reduction in the problem of public sector budget constraint, tax exemptions and reductions, provision of incentives to new market penetration, encouraging innovation enhancement and economic benefits and business growth incentives for the private sector, most public institutions are seen to apply less of the BOT contracts principles. According to Baidoo (2001), the emphasis on infrastructure investment has been a major cause of burgeoning government budget deficits and foreign debt, and cutbacks into sectors such as health, education and social welfare. This makes it more important for public private partnership (PPP) contract systems such as the BOT contract to be explored in developing countries like Ghana to boost infrastructural development and improve the living standard of the people. The concept of BOT is considered to allow for the participation of the private sector in the provision of public services

and facilities in order to reduce the strain on governments' finances (Cheung et al., 2009; Grimsey and Lewis, 2004). It is evident in Ghana that, in spite of the recent upsurge in construction activities such as road construction, building construction, construction of bridges and others, few public institutions that undertake various construction activities consider BOT contract principles resulting in a generally low patronage of these PPP principles in the public sector. This study identified ways and measures to explore the applicability of BOT contract principles in the rapid infrastructural development of technical universities in Ghana.

### III. PREVIOUS RESEARCH

#### 3.1 Overview of the Build Operate Transfer (bot) Contracts

According to the World Bank (2000), BOT is a contractual agreement that allows an operator to finance, construct and own the facility or system and operate it commercially for the project period, after which the facility is transferred to the authority. Also, Mubin and Ghaffar (2008) explained that in BOT projects, the private sector bears the cost of project first, and then owns it for certain period before handing it over to the government at no cost. The Build Operate Transfer (BOT) approach is an option for the government to outsource public projects to the private sector. A Build Operate Transfer (BOT) Project is typically used to develop a discrete asset rather than a whole network and is generally used for entirely new projects although refurbishment may be involved in some situations. In a BOT Project, the project company or operator generally obtains its revenues through a fee charged to the utility/ government rather than tariffs charged to consumers. In common law countries, a number of projects are called concessions, such as toll road projects, which are new built and have a number of similarities to BOTs. According to Mubin and Ghaffar (2008), BOT allows governments to reallocate scarce resources from infrastructure to other priorities, such as rural

development, poverty reduction, education and health. If BOT projects are conducted in a fully transparent manner and are properly structured, these will promote open competition, provide the lowest possible project cost and transfer most risks to the private sector.

#### 3.2 The Structure of Bot Contract

The BOT concept may be initiated by the property owner or the private sector. According to the UNIDO BOT guidelines (1995), most BOT projects are first identified by the host government. Through a published request for proposals, the host government will ask for bids as a means from interested sponsors or may receive speculative bids from individual sponsors to have a particular project delivered on a BOT basis. However, a number of successful BOT projects may be first identified by a private entrepreneur who will propose it to the host government or landowner. A BOT contract consists of the following stakeholders:

1. Client/government agency
2. Sponsor
3. Construction contractor
4. Operation and maintenance contractor
5. Financial institutions

#### 3.3 Stages In Bot Contract

Pollalis et al. (1996), states that the length of the concession period is determined in the concession agreement between concessionaire and principal. Within the concession period, the concessionaire must be able to recover investments for all funding parties. Six stages are identified during the concession period. The stages in BOT are as follows:

1. Preliminary study,
2. Selection process,
3. Project implementation,
4. Construction,
5. Operation,
6. Transfer.

### 3.4 The Effective Implementation of Bot

Potts and Patchell (1995), revealed that BOT projects involve a high degree of risk and uncertainty. The concession agreement signed by the host government and the project sponsor defines the scope of the project in commercial terms and allocates the political, legal, commercial and environment risks. Below are outlined some of the elements of a legal and regulatory framework for implementing a successful BOT strategy according to the UNIDO BOT Guidelines, (1995): The basic legislative authority for awarding BOT projects, Enabling public legislation and adequate security legislation.

### 3.5 Financing of BOT Contracts

One of the primary features of BOT is private financing which infers the concessionaire is fully responsible for acquiring the necessary funds to develop and operate the facility. The concessionaire will rummage around for the required funding in debt and equity. The return of investment is usually realized during the operational stage of the facility (Hawkers and Slater, 1988).

#### 3.5.1 Types of Financing Schemes

Potts and Patchell (1995), states that there are a wide variety of funds generally available for the construction of major projects such as BOT from a range of lenders and investors. In practice most BOT projects are financed using a variety of methods utilizing several different sources including: Equity capital, Loan capital, Commercial paper, and Non-recourse financing.

#### 3.5.2 Sources of Finance

Potts and Patchell (1995) states that the source of financing BOT project is from the developer (contractor) not the government or landowner, hence the financial expenditure is closely monitored during project implementation and this leaves no room for excessive waste on site. There are two sources of finance namely the

short-term and long-term finances. The sources of short-term finance include trade credit, invoice discounting and factoring, debt finance such as bank overdraft and loans. Bank overdraft and loan are effectively a form of long-term finance. Other sources of long-term finance are equity finance, leasing arrangements, retained earnings and financial assistance from the government. Some sources of loan capital for infrastructure construction works include the following: Clearing banks, Merchant banks, Finance houses, Building societies, Syndicates (usually a number of banks), financial institutions e.g. pension funds, insurance companies etc.

#### *Factors Driving the Adoption of Bot Contracts in the Public Sector*

*Some of the reasons for adopting PPP such as a BOT contract include the following:*

*Easy Fund Raising by Private Sector for Project:* Walker and Smith (1995) observed that the private sector has the ability to raise massive funds for large-scale construction projects thus reducing the host government's financial burden. The huge infrastructure gap in many countries cannot be provided by the government alone from the national budget. This will put lots of pressure on the financial status of government. It is therefore important for governments to engage the private investors who have the capabilities of raising substantial funds for large-scale infrastructure projects.

*Better Service Providing by Private Sector:* Private investors are known to provide better services to the public and have the ability to manage a good business partnership (Ghobadian et al. 2004; Walker et al. 1995). The private sector is able to provide better quality services than the public sector because it tends to adopt better technologies which improve the quality of project and service delivery. Moreover, they give better resources in terms of knowledge, skills and technology (Ghobadian et al. 2004).

*Better Risk Management by the Private Sector:* The private sector is known to better manage risk than the public sector. In fact, private investors normally adopt more efficient ways of procuring asset and delivering service thereby controlling many risks. This is one reason governments would want to engage the private sector to share any risks associated with public projects (Jefferies and McGeorge, 2009).

*Time Certainty:* Time certainty is achieved when the private sector is engaged in the construction and operation of public infrastructure over an extended period (Chan et al. 2006). In most PPP projects if the private partner completes the project before schedule, it is able to recoup its revenue earlier. On the other hand, any delays affect the company's profit. In situations where the delay in construction is due to the company's inactions, it is subjected to liquidate damages. The private partner is therefore motivated to complete on or before schedule. Cost certainty is mostly achieved in PPP projects as well.

*Reduction in Governments Infrastructure Expenditure:* The private sectors' participation in public infrastructure provision reduces public funds which is tied up in capital investment (Jones et al. 1996). With the participation of the private sector, governments can free up some funds to develop and support other sectors of social and economic priority (Efficiency Unit 2002).

*Allows for Shared Risk:* The transfer of risk is a primary objective in BOT project procurement system. The public sector partner seeks to divest itself of the risks associated with the delivery and operation of desired public facilities and services. Many of these risks relate to the time, cost and quality objectives of projects. Will the project be completed on time? Will it be completed according to budget? Will it be fit for its intended purpose? While risk transfer may be an obvious positive feature of BOT for the public sector, it is less clear how private sector parties might also share this view. However, under current guidelines in the UK, the public client provides

explicit information about risk allocation to confirmed private sector bidders during the contract procurement process for a project (National Audit Office, 2001).

*Saves Time in Delivery of Projects:* Traditional public provision sector responsibility for the delivery of public facilities and services inevitably carries with it the image of a bottomless purse in action. Regardless of unforeseen increases in the capital costs of projects, or higher than expected ongoing service delivery and maintenance costs, it is expected that funds will be available to resolve matters. BOT corrects this image, since it subjects capital expenditure decisions to the ruthless scrutiny of private sector commercial practice. Furthermore, the public sector partner is able to cap its final service costs at pre-determined levels through the concessional agreement made with its private sector counterpart (Tiong and Anderson, 2003).

*Reduce Public Sector Administrative Cost:* The public sector in BOT should be able to substantially reduce administration costs, since it will no longer have day-to-day responsibility for service delivery. Instead, the public client takes on a less intensive role of monitoring the performance of the private concessionaire and receiving periodic reports (Li et al. (2005)).

*Reduces the Amount of Public Funds Tied Up in Capital Investment:* BOT reduces the amount of public funds tied up in capital investment since it relieves government of a substantial proportion of public debt. It also slows unsustainable growth in the acquisition and maintenance of public assets that would otherwise occur at the expense of compromising the delivery of essential services (Jones et al., 1996).

*Reduces the Problem of Public Sector Budget Constraint:* The public liabilities involved in BOT projects do not appear as public sector borrowing in annual financial reporting, in the sense that the loans are taken out by private sector companies. By contrast, when public sector bodies borrow for investment purposes, the full value of the capital

raised counts towards the public sector borrowing and other measures of government deficit. The “off balance sheet” accounting possibilities offered by BOT are therefore attractive to financial administrators in the public sector. The exemption of BOT transactions from the public sector borrowing requirements isolates such schemes from centrally controlled budgetary allocations and the usual cash limits that accompany public sector expenditure (Akintoye et al., 2003).

*Provides Tax Exemptions and Reductions:* BOT procurement is seen as attractive to public and private sector participants because it forces a project to service any financial debt from the revenue streams derived from the project itself. There is no recourse to public funding, nor can the debt be secured by the underlying asset value since for most projects’ ownership revert to BOT procurement the public client after a pre-determined period. The revenue streams may comprise fees paid directly to the concessionaire by users (e.g. toll road fees), or fees paid by government on behalf of all potential users (e.g. fees per hospital patient serviced, or per school pupil accommodated). This non-recourse or limited recourse public funding is an important ingredient of BOT procurement (Akintoye et al., 2003).

*Reduces the Total Project Cost:* It is thought that, since the BOT procurement approach encourage private sector commercial efficiency to replace public sector bureaucratic inefficiency, it is reasonable to expect that total project cost can be reduced (Hambros, 1999).

*Facilitate Creative and Innovative Approaches:* An attractive feature of BOT procurement method is that it offers both the public client and the private contractor more freedom to select innovative methods in the provision of assets and services. This should lead to time saving by accelerating project development and by avoiding delays in project delivery (Cheung et al. (2010); Li et al. (2005)).

*Improves Public Infrastructure Management and Maintenance:* By taking over the responsibility for design, construction, operation and maintenance, private contractors have to consider design suitability and convenience for future construction and operation practice, by placing emphasis on improving the buildability and maintainability of projects (Hambros, 1999)

*Enhances Government Integrated Solution Capacity:* With BOT procurement, the project scope is capable of expansion to reflect a broader context. This might permit the development of an integrated solution, such as binding several small projects formerly dealt with under different departments (for example: a school, library, and recreation centre) into a single project, thus achieving economies of scale (Cheung et al. (2010)

*Offers Benefits to Local Economic Development:* BOT is seen as attractive in terms of the potential benefits it may bring to local economic development in the regions where the facility is built or the services are delivered. Local employment opportunities are enhanced, not only for the direct construction and operational activities associated with the project, but also for ancillary services and businesses established by entrepreneurs eager to exploit the opportunities created by its location (National Audit Office, 2001).

*Enhances Technology Transfer to Local Enterprise:* Internationally, and particularly in developing countries, BOT is seen as attractive in terms of its capacity to achieve the transfer of technological knowledge to local enterprises. Project procurement is arranged so that private sector partners with the desired technological expertise from more developed nations are enticed into joint venture type agreements with local companies (Nielsen, 1997; Trim, 2001) According to (Osei et al, 2014), this table shows a summary of the global reasons for adopting BOT by governments and private investors.

#### IV. RESEARCH METHOD

The study adopts the survey research design. Yin (1994) suggests that the best research method to use for a study depends on that study's research purpose and the accompanying research questions. Purposive samples (occasionally referred to as judgment samples) are done with a purpose in mind. Purposive sampling involves strategies in which judgment is exercised about who will provide the best phenomenon of interest, and then invitation is sent to the specific perspectives into the research. Purposive sampling was adopted for this study. According to Colin (2007) purposive sampling enables a researcher to use his/her own judgment to choose people that are presented or are available that best meet his objectives or target groups. Purposive sampling was used to solicit information from professionals selected from the Polytechnics that have been transitioned into technical universities in Ghana. The stratified sampling method was used to select and group the institutions, namely Takoradi Polytechnic, Accra Polytechnic and Cape Coast Polytechnic as well as their personnel and the construction-based professionals and experts. The study made use of questionnaire which constituted the major tool of the research and an interview session for selected respondents with experience on subject matter. One set of questionnaires was issued out. The set

of questionnaires were issued out to engineers, architects, quantity surveyors and selected stakeholders in the development offices of the selected Polytechnics with respect to the objectives of the study. the questions covered factors driving the use of BOT contracts for the accelerated infrastructural development in selected polytechnics and, barriers to the adoption of BOT contracts for the accelerated infrastructural development in selected polytechnics. The interview session followed the questionnaire to satisfy the third objective a propos identifying ways of incorporating the BOT contract into the public procurement system in Ghana.

#### V. RESULTS AND DISCUSSION

##### 5.1 Response Rate

The response rate was an excellent representation of the strata and could therefore be used as the basis for the analysis because twenty questionnaires (20) out of twenty questionnaires (20) administered to professionals in the various development offices of the selected polytechnics namely Takoradi Polytechnic, Cape Coast Polytechnic, Accra Polytechnic and contractors in Takoradi and Accra were retrieved. This indicates a 100% response rate for the administration of the questionnaires.

##### 5.2 Analysis of Respondents Basic Information and Discussion of Results

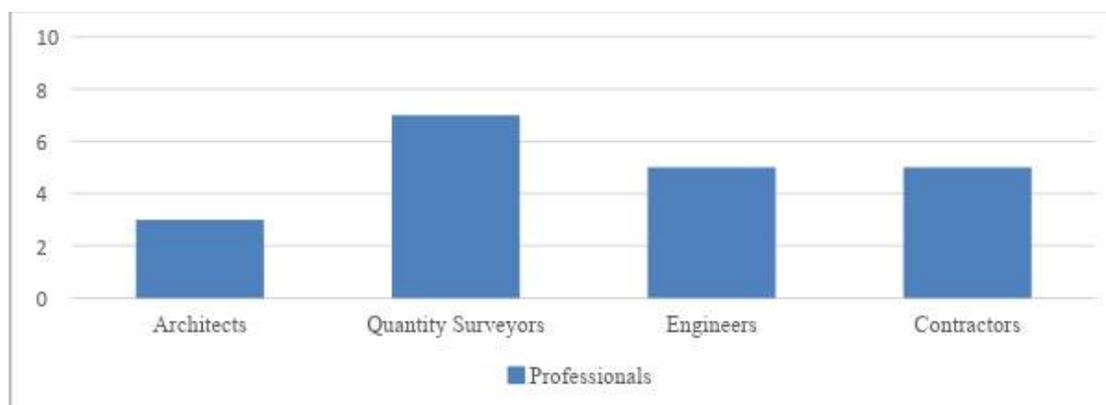


Figure 2.1: Professional Respondents

Source: Field Survey, 2017

Figure 2.1 above represents the construction professionals in the various development offices of the selected Polytechnics and contractors. Out of the twenty respondents (20) representing (100%), the majority of the respondents (7) representing (35%) were Quantity Surveyors as the highest percentage, (5) respondents representing (25%) were Engineers and (25%)

also for the Contractors with just a few being Project Managers during the survey. The analysis made above indicates that all the respondents were professionals in the construction industry in Ghana with knowledge of the construction industry. This credit the data collected since every respondent is a professional in the Ghanaian construction industry.

*Table 3.1:* Statistical Table Representing the Factors Driving the Use of Bot Contracts for the Infrastructural Development of Polytechnics in Ghana

DRIVING FACTORS OF BOT CONTRACT	N	Mean	Ranking
1. Provides government assistance in financing	20	4.80	1 <sup>st</sup>
2. Reduces the problem of public sector budget constraint	20	4.75	2 <sup>nd</sup>
3. Improves public infrastructure management and maintenance	20	4.75	3 <sup>rd</sup>
4. Private sector has ability to raise funds for project	20	4.75	4 <sup>th</sup>
5. Offers benefit to local economic development	20	4.70	5 <sup>th</sup>
6. Reduces public funds tied up in capital investment	20	4.70	6 <sup>rd</sup>
7. Private sector possesses better resource mobility	20	4.65	7 <sup>th</sup>
8. Saves time in delivering public project	20	4.65	8 <sup>th</sup>
9. Reduces public sector administration cost	20	4.55	9 <sup>th</sup>
10. Provides tax exemptions and reduction	20	4.55	10 <sup>th</sup>
11. Increases access to the public sector market	20	4.50	11 <sup>th</sup>
12. Facilitate creative and innovative approaches	20	4.45	12 <sup>th</sup>
13. Reduces the total project cost	20	4.40	13 <sup>th</sup>
14. Allows for shared risk	20	4.00	14 <sup>th</sup>
15. Enhances technology transfer to the local enterprise	20	4.25	15 <sup>th</sup>
16. Provides incentives to new market penetration	20	4.25	16 <sup>th</sup>
17. Enhances government integrated solution capacity	20	3.85	17 <sup>th</sup>

From the Table 3.1, the mean of 4.80 is the highest of the (20) respondents representing 'provision of assistance in financing government projects. The highest of the (20) respondents representing a strong agreement on the provision

of assistance in financing government projects agree with what was as found by Chan et al. (2010). Also, the second highest (mean of 4.75) represents the private sectors ability to raise funds for project, improves public infrastructure

management and maintenance and reduces the problem of public sector budget constraint as revealed by Walker and Smith (1995) and Cheung et al. (2010). As reviewed by British Columbia (1999); Liu and Wilkinson (2011); Li et al. (2005); National Audit Office (2001); Jones et al. (1996); Efficiency Unit (2002), the offering of benefits to local economic development and reduction of public funds tied up in capital investment is a major driving factor. Again, the next was the private sectors possession of better resource mobility and saving the time in delivering public project as reviewed by Grimsey and Lewis (2004); Chan et al. (2006); and Akintoye et al. (2003). Furthermore, reduction in public sector administration cost and provision of tax exemptions and reduction as it has been found by Li et al. (2005); Walker et al (1995). The next was an increase in access to the public sector market as found by Boussabaine (2007); Grimsey and Lewis (2004). The facilitation of creative and innovative approaches follows next as revealed by Chan et al. (2006); Akintoye et al. (2003); Cheung et al. (2010); Li et al. (2005). Further next was the reduction in the total project cost as reviewed by Li et al. (2005); Walker et al. (1995). Next was enhancing of technology transfer to the local enterprise and the provision of incentives to new market penetration as reviewed by Li et al. (2005); Walker et al. (1995). The next was the allowed shared risk and the last been enhancement of government integrated solution capacity as reviewed by Corbett and Smith (2006); Jefferies and McGeorge (2009); Chan et al. (2006) and Cheung et al. (2010) respectively. All of the above statements are all driving factors for the applicability of BOT contracts for the infrastructural development of polytechnics in Ghana.

#### *Ways of promoting the use of the BOT Contracts with the Public Sector in Public Procurement*

This part of the result is solely based on an interview session with experienced respondents selected by the researchers and were asked the question “What are some the ways of incorporating the BOT contract with the Public

Procurement system in Ghana?”. Results gathered are summarized in the list as to how the respondents expressed themselves during the interview and are as follows:

1. Although the concept of BOT contracts is quite old, in Ghana, its adoption in public institutions for infrastructural improvement is quite low, therefore extensive education through presentations, lectures, seminars etc. may help give the needed boost in its application.
2. The success factors of BOT projects based on the international case studies and research should be brought in the information of Employers launching BOT projects.
3. The pre-qualification mechanism of BOT projects in Ghana is required to be amended and research is required to be carried out that why the substantially strong projects offered are unable to get the attention.
4. The stakeholders of commenced BOT projects should be referred to by others for the sharing of the success.
5. The benefits earned from the BOT projects should be highlighted in media to gain the attention of local and foreign investors.

## VI. CONCLUSION

The paper concludes that five major driving factors for the adoption of BOT contracts for construction projects in Ghana are that: it provides government assistance in financing; reduces the problem of public sector budget constraint; improves public infrastructure management and maintenance; private sector has ability to raise funds for project; reduces public funds tied up in capital investment. With the participation of the private investor, governments can free up some funds to develop and support other sectors of social and economic priority. This in the long run is expected to enhance growth of the economy and improve the living standards of the people.

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